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Endaural Fenestration of the External Semicircular Canal

(Report of 120 Cases)

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THAT a temporary improvement of hearing in otosclerosis can be obtained by fistulization of the labyrinth has been known and at intervals reported. The permanent maintenance of the hearing improvement thus obtained remained a surgical problem to be solved. Since the days of Barany and Jenkins, both Holmgren and Sourdille have preoccupied themselves with a solution of this problem and made definitely important contributions in the advancement of this work. It is the consensus of opinion that one of the major factors responsible for the defeat of all surgical efforts made by my predecessors was due to their inability to maintain permanently open the fistula created. The technic which I devised and have employed for the last two years in a series of one hundred and twenty cases seems to have overcome this outstanding difficulty in the vast majority of cases.

The Lempert fenestration technic for the permanent restoration of practical physiological hearing in otosclerosis is based on the theory that a free mobility of the perilymph and endolymph for air-borne sound is essential to normal hearing by air conduction and that any impedance to such mobility results in deafness. Therefore, if in a case of air conduction deafness due to impedance resulting from otosclerosis, a permanently free mobility of the perilymph and endolymph for air-borne sound could be surgico-anatomically reestablished and the air conduction mechanism could be reconstructed to conform to the new surgical anatomy so as to further enhance the mobility of these endolabyrinthine fluids for air-borne sound, a permanent restoration of practical physiological hearing should be obtained providing the hearing by bone conduction in the three conversational frequencies 512, 1024 and 2048 is within the indicated normal limits at the time of operation.

The fenestration technic advocated for the permanent restoration of practical physiological hearing in otosclerosis is an endaural, plastic reconstruction of the auditory mechanism for the creation of a new air conduction apparatus. It consists of:

1. The creation of a trough-like fenestra of specified length and width in the bony capsule of the external semicircular canal with the aid of a polishing and burnishing burr. This fenestra is created in order to replace the non-functioning fenestra ovalis and thus mobilize the labyrinthine perilymph and endolymph for air-borne sound.

2. The incorporation of this newly created external semicircular canal fenestra, which is to assume the function of the fenestra ovalis, within the confines of a newly reconstructed air-filled and hermetically sealed tympanic cavity. To accomplish this it is necessary to:

a. Create a completely intact, liberated tympanomeatal cutaneous membrane which consists of that portion of the cutaneous lining from which the inferoposterior, posterior, superoposterior, superior and anterosuperior bony walls of the external auditory canal have been resected plus the tympanic membrane whose posterior, superoposterior, superior and anterosuperior margins of its circumference have been freed by the resection of the corresponding portions of the sulcus tympanicus on either side of the Notch of Rivinus. This must be accomplished without severing the continuity and attachment of the outer dermal layer of the liberated tympanic membrane to the liberated cutaneous lining of the bony canal walls.

b. Amputate the head and neck of the malleus thus freeing and mobilizing the tympanic membrane in order to permit the necessary manipulation thereof for its extension in a posterior direction so that the membrane flaccida may reach the external semicircular canal fenestra.

c. Maintain the incus with its short crus in position within the fossa incudis in the posterior lower part of the epitympanum.

d. Widen the tympanic air space by removing the pyramidal eminence from the posterior or mastoid wall of the tympanic cavity proper.

e. Cover and seal hermetically the reconstructed, widened air-filled tympanic cavity with the tympanic portion of the intact tympano-meatal membrane in a manner which will enclose the external semicircular canal fenestra within the confines of this newly created air space.

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3. The reconstruction of the osseus portion of the external auditory canal. This results from the creation of the tympanomeatal membrane. It serves to permit direct accessibility of air-borne sound to the new inner wall of the external auditory canal which is now formed by the tympanic part of the tympanomeatal membrane which covers the newly created and widened air-filled tympanic cavity of which the fenestra in the external semicircular canal is now a part.

The degree of improvement in hearing which is obtained and maintained as a result of such plastic reconstruction of the auditory mechanism in an otosclerotic ear depends directly upon and is in direct proportion to the exactitude and perfection with which each major step in this technic is completed plus the finesse employed in the execution of each and every one of the technic minutiae.

INDICATIONS

The above described fenestration is indicated:

1. When the hearing loss is bilateral and progressive.

2. When the stapes within the fenestra ovalis is fixed but the round window membrane has remained normal.

3. When the hearing by air conduction in the conversational frequencies 512, 1024 and 2048 has declined to a level which makes practical hearing of conversation impossible, while the hearing by bone conduction for these frequencies, as determined audiometrically under the condition of masking, has remained normal or declined to a level not lower than 30 DB. Bone conduction is the index of cochlear nerve function. Therefore, unless the bone conduction in the conversational frequencies is within the above indicated limits for normalcy fenestration is contraindicated.

4. When the tympanic membrane is normal and completely intact.

5. A complete absence of middle ear infection is absolutely essential and a history of never having had a middle ear suppuration before is preferable.

6. When the Eustachian tubes are patent.

7. A normal state of health is essential.

Our diagnostic means for determining which cases are definitely suffering from otosclerosis are rather meagre. I am, however, thoroughly convinced that otosclerosis is much more prevalent than it is generally assumed to be and that many cases diagnosed and labelled as Otitis Media Catarrhalis Chronica are really cases of otosclerosis.

A permanent restoration of the highest degree of practical physiological hearing by air conduction can be obtained following this fenestration technic in any patient suffering from a loss of air conduction hearing, no matter how great, in the presence of the aforementioned requirements.

The indications described were arrived at in retrospect after careful observation and study of many cases which were operated upon without a clear understanding of what was actually required in order to obtain the permanent restoration of practical hearing following fenestration of the labyrinth.

The following methods were employed to determine the preoperative and postoperative hearing state:

1. Audiometric testing which included an air conduction determination, a bone conduction estimation, and a bone conduction estimation under the condition of masking. A 6A Western Electric Audiometer was employed for these tests.

2. Fork tests both by air and bone conduction.

3. Testing by normal conversation and whisper.

SURGICAL ACCIDENTS

I. Injury to the cutaneous tympanomeatal membrane: In one case the meatal portion of the plastically created cutaneous tympanomeatal membrane was accidentally severed and detached from the outer dermal layer of the tympanic portion. This accident made it impossible to manipulate Shrapnell's membrane into position over the external semicircular canal fenestra. The severed meatal portion of the tympanomeatal membrane was placed over the fenestra.

II. In one case the amputation of the head of the malleus with the aid of a snare instead of the clipper resulted in a contra-coup longitudinal perforation of the membrana tensa by the manubrium mallei. This perforation healed and completely closed within three weeks post-operatively.

III. Fracture of the vertical mastoid portion of the Fallopian Canal: In removing the inferoposterior bony canal wall down to the level of the vertical portion of the facial canal the bony capsule of the Fallopian canal was accidentally fractured and the facial nerve was exposed but not injured. This resulted in facial nerve paresis which gradually subsided. The bony mastoid structure in this case was exceptionally brittle.

IV. The incudostapedial joint was accidentally disarticulated in three cases and resulted in the complete dislocation of the incus from the fossa incudis in each instance. This necessitated the removal of the incus in these cases.

V. In one case, where an extremely contracted mastoid process was encountered with the lateral sinus impinging upon the posterior bony wall of the external auditory canal, the sinus plate was accidentally struck and fractured and the lateral sinus wall punctured with a sharp curette during the process of removing the pyramidal eminence. The bleeding was controlled with a small piece of Iodoform gauze applied to the bleeding point. The Iodoform gauze was removed at the end of about five minutes and no further bleeding was countered. The operation was successfully completed. The postoperative course and convalescence remained uncomplicated.

POSTOPERATIVE SEQUELLAE

1. Postoperatively there has never been observed a rise in temperature of more than one degree

in any of the one hundred and twenty cases upon which the fenestration was performed.

2. Vertigo and nausea, in a varying degree, was present in all the cases for a period of from one to three days following the operation.

3. Two cases developed a serous labyrinthitis with intralabyrinthine fluid pressure symptoms two to three days postoperatively. This was apparently due to an inflammation of the tympanomeatal membrane extending to the perilymph space. In these two cases the serous labyrinthitis resulted in a complete loss of vestibular and cohclear function.

4. In one case necrosis of a small part of the anterior border of the outer mastoid cortex resulted and delayed the healing of the mastoid cavity until the sequestrum extruded itself two months later. The mastoid wound then epithelialized and healed promptly thereafter.

5. One patient died of a coronary thrombosis while dressing to go home from the hospital. This was purely coincidental and had no relation whatsoever to the operation.

6. No infection of the external, middle or internal ear was encountered in any of the cases following operation.

7. No patient in whom the fenestra remained permanently open ever complained of any subjective fistula symptoms after the third postoperative week.

SUMMARY REPORT OF HEARING IMPROVEMENT RESULTS

The fenestration operation was performed in one hundred and twenty cases within the past two years.

A permanent restoration of practical physiological hearing resulted in sixty-nine cases. These sixty-nine patients are now socially and economically rehabilitated.

A marked improvement in converational hearing resulted in ten cases. The improvement of hearing in these ten cases, though audiometrically impressive, did not, however, reach the level of improvement necessary for the restoration of practical hearing.

A further impairment of hearing resulted in fourteen cases. The impairment of hearing in these cases, though audiometricaly significant, practically, however, it did not in any way affect these patients as none of them were able to hear practical conversation prior to surgical intervention.

The hearing remained unimproved in twenty-seven cases.

In every case, where a permanent restoration of practical physiological hearing was obtained following fenestration, tinnitus completely disappeared on the operative side. In those, cases where the hearing improvement did not reach the practical level, the intensity of the tinnitus was greatly diminished. In those cases where the hearing remained unimproved, the tinnitus remained the same. In those cases where the hearing was further impaired following fenestration, the tinnitus was proportionately intensified.

Although the vestibular response to the fistula test remained positive in 100 of the one hundred and twenty cases operated upon, the hearing was improved in only seventy-nine cases. Thus, in 21 of the one hundred cases, where the response to the fistula test remained positive indicating that the newly created fenestra had not closed, the hearing, nevertheless, remaind unimproved.

The following audiograms are presented as characteristic examples of the type and amount of hearing improvement, as expressed in decibles, which was recorded in the successfully operated cases.

FENESTRATION VS. HEARING AID

1. Fenestration of the external semicircular canal restores physiological hearing function to the deafened. A hearing aid amplifies the spoken voice without improving the hearing function.

2. There is sufficient evidence in existence today that the progression of the hearing loss, which accompanies otosclerosis, is retarded and perhaps even checked, which only time can prove, as a result of fenestration of the external semicircular canal. The hearing aid permits the loss of hearing to continue to progress unabated until it reaches the stage when the hearing aid ceases to be of any value to the patient.

3. Tinnitus, which is the most distressing symptom accompanying deafness from otosclerosis, is eliminated following a successful fenestration operation. Whereas, when the hearing aid is employed, the tinnitus remains unchanged.

4. Fenestration restores the hearing intelligibility for group conversation. The hearing aid is conversations.

5. Following fenestration, the patient can hear conversation or any other sound coming from any direction, even when not directed at him. With the hearing aid, they can only hear person-to-person conversation when directed towards the receiver of the hearing aid.

6. Following fenestration, conversation is heard as it is normally spoken, while conversation heard with the hearing aid is distorted in tone.

7. The restoration of physiological hearing, as a result of fenestration, improves the entire mental status of the patient, whereas the wearing of a hearing aid depresses the mental state of the patient still further.

8. The hearing aid cannot be employed for direct telephone conversation.

9. The social and economic advantages obtained as a result of a successful fenestration operation are limitless. The hearing aid is a deterrent to social and economic rehabilitation.

10. The use of the hearing aid cannot be compared to the use of visual aids, because we are expected to hear conversation or any other sound directed towards us or anyone else, in and from any

direction. Such hearing protects us and guides us in life's hazards and is also necessary in our daily economic life, whereas, we are only expected to see when we are directly making a special effort to look in the direction of the object we are trying to visualize.

CONCLUSIONS

1. There is no surgical risk to life involved in the fenestration of the external semicircular canal for the restoration of practical physiological hearing in otosclerosis when this surgical procedure is performed under the strictest rules of asepsis.

2. The amount and nature of the discomfort a patient is subjected to as a result of this surgery compares favorably with any other elective major surgical procedure and is disproportionately small when compared to the physical, mental, social and economic benefits derived from such surgery when it results in the restoration of practical hearing.

3. As a result of this surgical procedure, practical physiological hearing can be permanently restored in about 80% of properly chosen cases of otosclerosis. The success of this work, of course, will always vary with the skill and patience of the operator.

4. That hearing can be improved by fistulization of the semicircular canal has been known for many years. The problem of maintaining such hearing improvement was a technical one awaiting solution. It is for these reasons that only those who will take cognizance of the great importance that fine details of technic minutiae play in the solution of this problem, can expect to be rewarded by the long awaited results which can only be obtained in such a way because the anatomy involved is minute and does not permit great latitude in the handling thereof. There is no doubt that a simpler and less complicated technic ought to be developed to improve hearing in otosclerosis. But, as long as one of the essentials of any technic developed will be the creation of the fenestra in the bony capsule of the labyrinth, the technic for the improvement of hearing will remain one of the most delicate and most difficult of accomplishments, because in order to create the kind of a fenestra which will result in a permanent maintenance of the maximum degree of the improved hearing obtainable on the table, the greatest amount of delicacy in creating such a fenestra required will undoubtedly meet with objections from otologists who have not been trained for such delicate surgery. This in itself will always make fenestration a difficult technic.

5. This operation should not be regarded as just another operative technic added to the list of operative procedures on the temporal bone. This operation blasts a trail for a new and different type of surgery on the temporal bone. It is based upon different surgical principles than any surgery heretofore employed for the relief of suppurative lesions in the temporal bone. The best results from this surgical procedure will be obtained by otologists who, in addition to an extensive experience in all surgery upon the temporal bone, are possessed of thorough knowledge and understanding of the surgical principles of plastic reconstructive surgery.

6. In fairness to the already successful development of the surgery for otosclerosis and for the protection of its still brighter future, no otologist, no matter how skillful a surgeon he may be, should attempt this particular operation without receiving special training in this type of surgery under supervision and guidance.

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Changing Concepts of Tuberculosis During Twenty-five Years

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REST, fresh air, good food and climate were the methods recommended for the cure of tuberculosis when I reached New Mexico 33 years ago. The private sanatorium was still in its swaddling clothes and the only two institutions in the state were the Cottage Sanatorium and St. Joseph's at Silver City. These were both so-called closed institutions headed by a medical director, the former by Dr. E. S. Bullock and the latter by Dr. Hammer.

The National Tuberculosis Association had but recently come into existence and the public at large knew little concerning the disease. Dr. E. A. Trudeau had established his Sanatorium at Saranac Lake in 1884 and had demonstrated to the profession that tuberculosis was not a hopeless disease from a clinical standpoint. His work gave impetus to the Sanatorium movement which began in the early nineties, and has since grown to its present proportion.

The climate controversy was at its height. Men east fought with men west, and when the argument was over each side left with opinions still unshattered. The western physician did not tend to clarify the situation. Each man after he established his private sanatorium issued a bookled. The march up this mountain and down that valley as opposed to some other mountain or some other valley, the minute examination of the soil and turf of one mesa as contrasted with another a few miles away, made the wanderings of the Jews pale into insignificance. After all this painstaking investigation, this careful phthisiotherapist decided upon his particular desert as the best of all possible climates in which to restore the bloom of health to

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the consumptive's cheek. And all this, mind you, when we know that all other factors being equal, one spot in the desert is as good as another, for the climatic treatment of tuberculosis.

Tuberculin, as a therapeutic agent, held the limelight for a number of years. Introduced by Robert Koch as a cure, its use was universal. As time passed, however, and clinical results were given careful study, another failure was added to the already long list. Today one rarely finds a physician who still believes in its curative value for pulmonary tuberculosis.

The question of infection and immunity was given much study, and what seemed almost a solution a quarter of a century ago has been challenged by the work of Dr. J. A. Myers and his associates at the University of Minnesota.

Formerly it was taught that adult tuberculosis was the "end of the song begun at the cradle". The moment a new-born soul emerged into this best of all possible worlds it began to inhale the ubiquitous bacillus, and from this contact one of three things happened. Either the infant received an overwhelming dosage and died promptly of a miliary tuberculosis, or the dosage was not massive enough to kill but too great to protect and a scrofulous type individual resulted. This child usually developed clinical tuberculosis in the teen age or in the early twenties, as a result of failing or insufficient immunity and the adult type of tuberculosis became manifest. Then there was the infant whose repeated infections were so regulated by Fate that a perfect immunity was developed which remained protective for life. As proof of this theory, its adherents cited the fact that 6/7 of the human race never break with clinical tuberculosis, while the other 1/7 develop the disease. They also called attention to the fact that uncivilized races, such as the American Indian, the African negro, the South Sea Islanders, and the white Esquimox were free from tuberculosis until the advent of the white man. Then when the bacillus became implanted on virgin soil the disease ran rampant, due to the fact that no immunity had been developed and the reaction was like the first massive infection in the new-born white child.

Animal experiments, too, added their proof. Take two guinea pigs, immunize one by repeated injection of living tubercle bacilli until immunity has taken place. Put the immunized animal and the control animal in a sealed box. Subject them to a spray of virulent tubercle bacilli for a given time. Afterward inject both animals with massive doses of live bacilli. The immunized pig manifests no ill efects while the control dies of a generalized tuberculosis.

It is this experiment which would seem to show that most adult tuberculosis is of endogenous origin, although, of course, there is always the possibility of sufficient massive exogenous dosage to re-infect.

The adherents of this theory felt that early infection with the tubercle bacillus was essential to the production of immunity, and welcomed the positive tuberculin reactor. The child who grew to adult life with a negative reaction was a cause for medical and parental anxiety.

All of this evidence seemed incontrovertible until Myers' work was published. Myers contends that the human race should be spared infection if we are to conquer the disease. He claims that the first infection is a mild affair and is soon overcome. The child is no worse for the experience. Later, if re-infection takes place, it may be another story. Resistance is lessened and the disease may prove fatal. He, therefore, concludes that if all infants and children can be spared infection—can be negative reactors to tuberculin—then if contact takes place, the disease will be similar to the first infection type of childhood and will be more or less of a benign affair.

As proof of the theory, he cites his work with children at Lymanhurst and at the University of Minnesota. All are tuberculin tested. He shows that when the negative reactors among his students and nurses come in contact with infection and react positively to the tuberculin test the disease, both from clinical and x-ray standpoints, is similar to the clinical and x-ray features of first infection in childhood. Many are so free of symptoms that unless tuberculin testing is done and x-rays made, the disease may go unrecognized. The majority of this type may go on through life with no further evidence of disease, while the positive reactor in childhood who gets a re-infection in adult life may develop a serious type of tuberculosis. Much discussion and much added study has been the result of this new side light on infection and immunity. Much more discussion and much more study will be necessary before definite conclusions can be drawn.

Treatment saw no definite change until the advent of artificial pneumothorax. This method of cure was given an impetus by the epoch making paper by Dr. Mary Lapham of Highlands, N. C., before the National Tuberculosis Association in 1912. Dr. Lapham reported 23 cases, covering a period of three years' work. The results were so encouraging that the profession went wild. Dr. A. G. Shortle returned to Albuquerque with a machine and I asked him to come to Silver City to show me the technique. This he willingly did and both Dr. Bullock and I worked together for a year, when I went to Albuquerque to be associated with Dr. Shortle. This all occurred about the time the Southwestern Medical Association came into being, and whose 25th birthday we are celebrating at this meeting.

The early days of pioneer work were filled with many misgivings. For two years we worked without advantage of a suitable x-ray equipment. Lungs were over-compressed, mediastiniums were shoved far towards the opposite side, diaphragms pushed downward with displacement of liver and other abdominal viscera, and many times the un-

happy patient made worse rather than better. X-ray apparatus changed the pictured. With repeated fluroscopic examinations, lungs could be properly collapsed and from then on the results brought encouragement to both physician and patient.

Even in the early days of discouragement, I repeatedly made the statement in published articles that the method was here to stay, that it was a marked step forward in treatment, and that ultimately it would become a part of the armamentarium of every chest specialist treating tuberculosis.

That prophecy has come to pass. In many institutions throughout the country as high as 80% of patients are under some form of collapse therapy. At first, pneumothorax was the only method of lung collapse, and until intrapleural pneumonolysis came to the rescue, many failures were due to unbreakable adhesions. The cauterization of these adhesions has converted 80% of incomplete compressions into complete, thus giving cavity closure and negative sputum.

Later, crushing of the phrenic nerve was also found to convert a small percentage. This minor operation was also done where pneumothorax was impossible, and before advising more radical surgery.

Thoracoplasty finally, like pneumothorax, has won its place as a valuable adjunct in cavity closure. Our work in the southwest covers a period of sixteen years in the use of this major type surgery.

It is my firm conviction that all suitable patients should be given the benefit of some form of collapse therapy after a reasonable tryout on bed rest. This time should not exceed three months and many patients present conditions that call for immediate compression treatment.

Having traced the gradual change from long drawn out rest, food, fresh air and climate, to the surgical treatment of tuberculosis, I shall now rid myself of a few homely truths.

First of all, I congratulate myself on my age. I realize that the day of the tuberculosis specialist in the southwest is over. At least, the cream has been separated from the milk. We in the desert get the skimmed variety. Up to the crash of 1929, money was plentiful. The butcher, the baker, the candlestick maker, spent his along with the millionaire. Private sanatoria were filled and were happy with a long waiting list. People believed in climate and were willing to pay for the luxury. In fact, buying luxuries in those days was proof conclusive of the fatness of one's pocketbook. Patients bought climate the way they bought Packards, Pierces and Cadillacs. No one considered a commodity valuable unless the cost mounted into the high brackets. Unless a doctor in private practice charged a fat fee, he was looked down upon. The masses wanted the best and were willing to pay for it. Today we see a different picture. Through the passing years, State, County and municipal sanatoria were being built, and after the depression hit and Roosevelt became big-hearted, more and bigger ones were added to the already mounting list.

People who formerly flocked to climatic resorts found their pocketbooks too flat to make the venture. The only ones who did not fear the desert were the men and women on relief. They could live one place as well as another. Needless to say, they are a medical liability rather than an asset.

The private sanatorium, east as well as west, was deserted for the public institution. Examinations were made by clinics instead of private physicians. Thus the private sanatorium and the private practitioner saw the clouds gather and the storm break.

Collapse therapy added its mite. Patients were cured at home before they had a chance to give climate a thought. If the public institutions were full, out patient departments and clinics started the collapse treatment, and many were restored to health without even entering an institution.

This situation is here to stay. Tuberculosis is a State disease. The future of the private sanatorium and the tuberculosis specialist lies only in past memories. True, those of us who have lived through all these years may be able to keep the home fires burning. A few private institutions may struggle on until the old medical director is buried. The fact remains, however, that a new era has been born, and with it has come a marked change in the economic treatment of tuberculosis. Climate is not the factor it once was. Collapse therapy has pushed it from the position it once held and it can never stage a come-back. The old tuberculosis specialist will die and be buried, to be replaced by his younger colleagues who are much better able to face the present situation with tolerance and understanding.

"We who are about to die salute you!"

221 W. Central Ave.

Thirty Years Observation of Intestinal Obstruction

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INTESTINAL obstruction is, of course, too great a field in surgery to be discussed in any one thesis. For this reason this paper will be confined largely to our own personal observations and to phases of mooted interest in this subject.

The relief of an intestinal obstruction may be as simple as a simple appendectomy and again it may be one of the most difficult conditions to deal

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with in surgery. In this communication we propose to discuss mainly dangerous and difficult cases, often complicated by a diffuse peritonitis.

For the purposes of this essay we shall limit ourselves to a brief discussion of some interesting points in complete and incomplete intestinal obstruction.

The diagnosis of complete intestinal obstruction is usually easy and not intended for discussion here, but it is well to remember that the closer the obstruction is to the stomach the sooner nausea and vomiting occur. From these high obstructions distension and peritonitis rarely occur early because the small amount of intestine involved is decompressed by vomiting. These very high obstructions will go on for weeks or even months without any fatal systemic stresses. The patient loses strength and weight because almost as soon as he begins to eat he becomes nauseated, then vomits. The process then becomes one of starvation, and it is rare that the patient would die of peritonitis.

Excluding duodenal obstruction the highest obstruction we have ever seen was about 3½ feet below the pylorus, and the second highest about 7 feet below the pylorus. The first mentioned was of about 10 days duration and the latter of many months duration. The latter was emaciated, the former had only lost some weight. The latter was greatly distended in the upper abdomen and was flat below; the former was not distended at all, and neither had any peritonitis.

Incomplete obstruction may on occasion be quite difficult to diagnose. This form of obstruction, these days, is most commonly due to post-operative adhesions. These adhesions are not due to the operation, *per se*, but to the inflammatory process present at the time of operation. Nearly all such adhesions followed an operation in which pus was encountered within the abdomen or in which the inflammatory process had passed the bounds of the disease for which the operation was performed.

Perhaps the most difficult feature in incomplete intestinal obstruction is to tell what cases should be operated. The cases that should be submitted to surgery generally give a history of at least one former operation. That operation was most generally for a ruptured appendix, a pelvic infection, or any abdominal operation in the presence of pus or widespread inflammation. The patient has increasingly severe indigestion with gas pains generally over the lower abdomen. These gas pains are intermittent and often quite severe. The severer the gas pains and the sooner they come on after eating the more necessary it is that the patient have surgery. Frequently these patients will tell you that they have "knots" or "lumps" that they can feel in the lower abdomen, when their indigestion is quite severe. In thin patients we have sometimes seen just such tumors through the abdominal wall. You may be sure that such peristaltic waves are distending the gut above a more or less acute kink. With a stethoscope you can hear the gas and fecal contents gurgling through the partial obstruction below. There is nearly always nausea present, and occasionally vomiting. The more persistent the nausea, the more urgent is the demand for surgery. Persistent vomiting should never be allowed to occur, because this means complete obstruction or near complete obstruction.

All patients with the above symptoms should be hospitalized, and all should be operated as soon as the patient is in the best possible condition for surgery. Those cases with milder symptoms, and with whom the bowels can be moved daily, may be temporized with, but not otherwise. No patient with pain within the belly should ever be given a purgative until after it has been definitely determined what the pain is due to. With rare exception, enemas may always be given without danger to the patient. Whereas purgatives may be fraught with danger and may cause the death of the patient.

When there is complete obstruction an early diagnosis is imperative, while in incomplete obstruction the earlier the physician can determine the necessity for surgery the greater is the chance of surgery obtaining a permanent cure.

PROGRESS IN ABDOMINAL SURGERY

In looking back over 30 years of our personal observations it is evident that progress in the surgery of grave abdominal conditions has been a steady, healthy evolution rather than sudden radical changes.

The major problems in treating grave cases of intestinal obstruction have always been the same. These are: 1, hypohydration; 2, abdominal distension; 3, pain, restlessness and tenseness of the patient, and 4, sustaining the patient until he can take food by mouth.

Hypohydration—We can see that failure to appreciate hypohydration was the main cause of a comparatively high death rate in the first decade of this century. The hypohydration was not appreciated; the insistent call to relieve the patient's thirst after any serious operation was appreciated. It was also appreciated that to prevent suppression of the urine the patient must have fluids. To meet these very apparent demands 40 years ago, some surgeons filled the abdomens with normal saline before closing, noting that these patients made an easier recovery. Personally, we gave every patient, on return to bed after laparotomy, a pint of warm black coffee instilled into the rectum. This was followed every 3 hours by an 8-ounce instillation of tap water by rectum until patient was able to take water freely by mouth. This method worked very well, and it was gratifying to see how well the kidneys functioned after abdominal section, and how easily the patients recovered compared to our hospital interne days.

The next great step towards combatting hypohydration was the Murphy rectal drip, which came into general use about 1910. This served very well for all ordinary laparotomies, but in grave abdominal conditions with diffuse peritonitis and se-

vere distension it was totally inadequate. To meet this extreme demand parenteral administration of fluids has now, for several years, come into general use with the greatest benefit. So far as we know, Hendon's "venoclysis" first met the demand for the parenteral administration of large quantities of fluids by the drop method. Hendon's original technic exposed and opened the vein with the introduction of a canula, through which the desired fluids were administered. Now this drop technic, which should always be used, has been simplified by passing a needle into the vein without open exposure.

Abdominal Distension—Little progress was made in relief of this most dangerous feature of general peritonitis, until Kanavel introduced his duodenal tube in about 1916. Before that time all we could do was wash the stomach at intervals through a rubber tube that looked like a length of a small-sized garden hose. When Kanavel introduced his small-sized duodenal tube a great step had been accomplished in treating this dreaded complication. The small size of this tube permitted it to be passed through the nares into the stomach and duodenum, and left there for hours or days as required. This constant siphonage of the contents of the distended intestines did much to relieve the intraintestinal stress, and so saved many thousands of lives. When Wangansteen added constant suction to the Kanavel tube, its effectiveness was doubled. With this combination we now have a fairly satisfactory method for life-saving intestinal decompression.

The Miller-Abbott double-lumen intestinal tube has now been added to the above to combat intestinal compression. This 10-foot double-lumen rubber tube looks like the ordinary duodenal tube and is the same size. With this tube the entire length of the small intestine can be decompressed. The tube and the idea looks excellent, but so far as we have had only two cases in which the tube was used, and consequently know little about its practical use.

Pain, Restlessness and Tenseness—Every patient with general peritonitis has pain and is tense and restless. This must be relieved because the restless patient is headed straight for destruction. Here our old friend and enemy, morphine, comes to the rescue. It relieves the pain, quiets the restlessness and puts every muscle at rest. It should be given regularly at 3- or 4-hour intervals in sufficient quantities to keep the patient quiet and relaxed.

Parenteral Feeding—The addition of dextrose to fluids for parenteral administration to prevent or relieve hypohydration has been a godsend. It permits us to carry our patient through days or even weeks until food can be given by mouth. Dextrose calories administered directly into the blood in the isotonic 5% concentration mean far more than twice the same number of calories taken into the alimentary canal.

Dextrose was certainly used for parenteral feeding as early as 1905, but it required 25 or 30 years of evolution before it came into general use as now practiced.

ANESTHESIA

The choice of an anesthetic in these grave cases is of the greatest importance. Personally we use subarachnoid anesthesia in nearly all these cases, and *always* when the patient is *very sick*. So far as we are concerned, there are no contraindications for its use. It has many advantages over any other form of anesthesia. It gives perfect relaxation and there is little or no shock following its use. The intestines lie perfectly still within the abdomen while you are operating and are not constantly popping up into the wound as is so often the case with gas or ether anesthesia. The quietness of the intestines enables the surgeon to handle only the diseased gut and so avoids spreading of infection. Pads, or rubber sheets, to hold back the intestines, are rarely required. So long as the patient is still living and you can accomplish anything by operating, you can perform that operation, without injuring the patient, with spinal anesthesia. We have saved several patients in just such extreme condition by its use.

OPERATION

Make a midline incision because there is no other incision that offers so wide a field of vision. It can be made high or low and as long as necessary, and may always be closed to insure against a post-operative ventral hernia. It can be reopened when necessary, again and again, and still be closed securely. This can be said of no other abdominal incision. If there has been a previous operation, reopen through the old scar, and not beside it, as is so often done.

CASE REPORTS

Case 1—Mr. C., white, age 20, was admitted to the hospital Sept. 5, 1931. He gave the history that he had been operated on a year before for an acute appendicitis. The appendix had ruptured and drainage was used. Following a prolonged recovery, and at varying intervals during the succeeding year, he had had 4 different intestinal obstructions. He had been reoperated each time. At the fourth obstruction a section of ileum had been removed and a Murphy button anastomosis made.

Examination of this boy Sept. 5, 1931, showed that he again had a complete intestinal obstruction. He was very sick and had a distended abdomen. He had 5 operative scars, made parallel with each other, and extended from the regular McBurney incision site almost to the umbilicus The right rectus muscle had wasted away over the involved area, and a large ventral hernia resulted.

This boy was given spinal anesthesia, and the abdomen opened through one of the medial scars. The abdominal wall consisted of skin, some scar tissue and peritoeum only.

The obstruction was due to adhesions of about 3 feet of ileum, massed about the site of the Murphy button anastomosis. Besides the obstruction adhesive mass, there were other adhesions everywhere.

All adhesions were carefully separated and the abdomen thoroughly cleaned up. Then we did a plastic operation to close the boy's hernia as well as possible. There is nothing more likely to start new adhesions within the abdomen than a ventral hernia.

This boy was carried on dextrose solution, and the routine outlined here, for 4 days, and then made a nice recovery. He did well for 2 years, during which time we followed his activities with a great deal of interest. After this period he went to California and we lost trace of him.

This boy will always be a weakling on account of his weak abdominal wall. Had his surgeon made a midline incision at the first obstruction, and clung to that one incision for each succeeding obstruction, he could have still have a good, strong abdominal wall. Further, a strong abdominal wall would have greatly reduced his liability to a return of the adhesions.

In incomplete obstruction cases, the pathology will nearly always be found to be due to intestinal and omental adhesions. Every single intestinal and omental adhesion must be carefully separated until every inch of gut is entirely free. A careful search of the abdomen should be made for any pathology that was either overlooked at the former operation or may have occurred since then. All pathology found must be removed because the patient will not recover health unless this is done.

Where there is no peritonitis and the patient is in fair condition, the recovery is easy, and the great majority will stay well. If even one bad kink is left, the whole condition is liable to return, as bad or even worse than before. Patience, gentleness and thoroughness are the price of success in these cases.

The most difficult of all complete intestinal obstructions to deal with are those that were incomplete and have for some cause become complete. If the patient is in bad condition and the obstruction is due to some one coil of gut or other condition which can be easily and quickly freed, this should be done and the abdomen closed. No wise surgeon will subject his patient to greater danger than necessary, but it is well to remember that the complete operation frequently has to be done later. Often in these cases you will find the obstruction due not to a single coil or band but to a whole 10 or 12 feet of matter gut. In these cases we separate every adhesion just as we do in the simple cases, even if we have to resect a part of the gut. It is surprising how many will recover when so treated. Even under the most adverse circumstances careful surgery will at least occasionally be successful, as the following cases show.

Case 2—Mrs. S., white, age 57, was admitted to hospital Jan. 31, 1937. We had never seen the patient professionally before. There was the following pertinent history.

Many years ago she had an appendectomy. Several years later she had another abdominal operation whch proved to have been a hysterectomy. Five years prior to admission to hospital she was operated for an intestinal obstruction. Following this operation she had severe indigestion and gas pains daily after eating anything. For a month prior to hospitalization she had had continual abdominal pain and great difficulty in getting any bowel movement at all. For three days before admittance to hospital she had no bowel movements and had constant pain, nausea and vomiting.

Examination revealed a typical, very late, complete intestinal obstruction, due to adhesions. The abdomen was badly distended and patient in poor physical condition.

After a hasty preparation, the patient was taken to surgery. Spinal anesthesia was given and the abdomen opened through the old midline scar—one of three. The entire lower abdomen was one mass of adhesions, involving nearly all the small gut, the bladder, rectum, sigmoid colon, and omentum. The adhesions were so dense that every adhesion had to be cut inch by inch. Even the folds of the mesentery were adherent to each other. Twelve to 14 feet of small gut was in one mass—or better, mess—and so rotten that six holes appeared in the gut in spite of the most careful separation. Further, there was 18 inches of ileum—beginning 1 foot above the ileocecal valve—which lay in the deep pelvis. It was attached to bladder, sigmoid and apparently to the stump of the removed uterus. This 18 inches of gut was gangrenous and had to be cut away, and a lateral intestinal anastomosis was done. Really it looked hopeless to save the 12 feet of gut above, but such long resections are so fatal and give such unsatisfactory after-results that we decided to try to save the gut. Along the removed gut, and at the site of almost all the holes above, were small abscesses.

The whole thing looked so hopeless that many times we felt like giving up, but we stuck it out until every hole was closed after the rotten gut had been trimmed from its margins. Further, every adhesion within the abdomen was carefully separated. The work within the abdomen required 2½ hours, and then 1 hour doing a plastic closure of a weak abdominal wall on account of three separate incisions for previous three operations.

The patient was kept on continuous drip of dextrose solutions for 6 days. The bowels moved on the sixth post-operative day, and thereafter regularly. Also on that sixth post-operative day the abdominal distension mostly disappeared.

On the eighth day a fecal fistula developed, and closed in about a week.

On the fortieth post-operative day a fecal fistula developed into the urinary bladder, and both feces and oil—given by mouth—appeared in the bladder. Doctor Multauf did the cystoscopic work and reported the fistulous opening 1½ inches above ureteral orifice on the right side. This fistula healed in a week, but there were minor leakages two or three times during the next month, when it permanently closed. No treatment for the fistula was given except a retention catheter in bladder for 1 week until fistula made its first closure. After that, observations only were made.

This patient, in spite of all the complications, made an easy removery, after the first 5 days, and has remained perfectly well since recovery.

Case 3—Mr. G., (sent by Doctor McClane, Roswell), white, age 51, entered hospital May 12, 1937, on a stretcher. He was a very sick man. He had a bad mitral regurgitation and a right chest effusion with heart and trachea thrust perceptibly to the left. He was struggling for breath like a pneumonia patient. Temperature was 101 and pulse 120.

His white blood count was 9,600, with 65% polymorphonuclears. Wasserman, Kahn and Eagle tests were negative. Blood culture negative. Urine was essentially negative. His abdomen was distended but not tender. He had made over a 200-mile trip by ambulance to enter the hospital.

This patient's chest and heart condition was so bad that he was turned over to the medical service of Doctor Awe for treatment. Doctor Awe treated him for 7 days, during which time he was nauseated and vomited frequently.

This man gave the history of his illness as a very insiduous onset, beginning about 23 days before entering hospital. The onset was without any pain, but a slow abdominal distension and a feeling of general malaise. Due to gradual abdominal

distension, patient said he thought he was getting fat. He had fever and gradually grew worse and worse until he was sent to the hospital. History of attacks of appendicitis years ago, but never was operated.

One of the peculiarities of this case is that he said he never had any pain at any time.

May 18 a barium enema was given and the fluoroscope showed complete obstruction in sigmoid flexure. A skiagram showed the same obstruction and also barium that had been given in Roswell 12 days previously.

On May 20 it was evident that he had developed a complete obstruction, and he was taken to surgery.

This man was the worst possible surgical risk. Spinal anesthesia was given without any disturbance to patient's shaky heart or manifestation of shock.

Operation—Midline incision. Small intestines greatly distended above a mass of adhesions in pelvis extending from sigmoid to cecum. The pelvis was full of various pockets of stinking dirty pus—at least 8 ounces in all. These put pockets were opened as the 8 feet of ileum involved was carefully separated from its mass of adhesions. The first complete obstruction was a kink of ileum lying beneath the sigmoid and covering the largest pocket of pus. This was the obstruction shown by barium enema.

In spite of the greatest care in separating adhesions, four holes were torn in the gut. These were closed with No. 0 chromic catgut. To prevent intraintestinal stress throughout this semi-rotten gut, a Pezzer catheter was put in the ileum 6 inches above ileocecal valve.

From the nature of the pathology found it was evident that the appendix was its origin, but no appendix was found—it had sloughed completely away. To be sure that no part of the appendix was left within the abdomen, the parietal fold of peritoneum was incised and the cecum was turned up, giving perfect exposure of the posterior cecal area, but no part of the apendix was found.

This man was carried on intravenous dextrose solution for 7 days. Duodenal tube decompression was continued the same length of time. Every adhesion was relieved and every kink in gut straightened before abdomen was closed.

In this case the Pezzer catheter in the ileum worked perfectly and without any fecal leak around catheter at any time. No fecal fistula developed from the sutured holes in the gut. The catheter was removed on the thirteenth post-operative day and the opening in the gut closed in 24 hours.

This man went home on the twenty-first post-operative day with his right lung effusion all cleared up and his heart pretty well compensated. Within 6 weeks he was back at work and has remained well since. We keep in constant touch with him.

For a number of years now, we treat all these dangerous cases just as we do our acute diffuse peritonitis cases. As soon as the patient is put to bed, a 5% dextrose solution is started intravenously, at 70 drops a minute. A Kanavel duodenal tube is passed into the stomach. If there is any distension, Wangensteen suction is added at once.

Each 24 hours we give from 3,000 to 5,000 cc. of 5% dextrose intravenously, as the patient's condition seems to demand. The first 1,000 cc. is given with normal saline and all the rest for the entire 24 hours with distilled water. These injections of dextrose are given at regular intervals and require from 3½ to 4 hours to administer. When the patient is very sick indeed, we frequently administer the dextrose without intermission, during the whole 24 hours, and so continue until the patient is considered in good condition. When the intravenous dextrose is administered throughout the whole 24 hours, the speed of flow is slowed to 40 to 45 drops per minute. We have frequently used 10% solutions of dextrose, but the increased food value does not seem to be necessary and it offers difficulties in administration that the isotonic 5% solution does not.

Some patients' veins are very difficult to enter with a needle, and such patients may be given 1,000 to 2,000 cc. of dextrose by hypodermoclysis in either normal saline or distilled water. It should be given slowly by the drop method. Hypodermoclysis serves very well, but the patient with good veins is a better risk.

Sufficient opiates are given at regular intervals to thoroughly relax the patient and keep him quiet. We nearly always use pantopon, because it apparently acts just as well as morphine and is practically non-habit forming, and is consequently more easily withdrawn at the end of a long illness. In old people we usually use morphine, because it does seem to be more stimulating and seems to act better in such cases.

Wangensteen suction decompression, intravenous dextrose and sufficient opiates are given consistently until the patient's bowels move. This usually occurs in from 6 to 9 days after operation. The patient usually begins to pass gas 12 to 24 hours before the bowels move.

We give no stimulants and no prostigmine or other peristaltic stimulants until patient is passing gas freely by bowel. If given sooner, peristaltic stimulants shock the patient and do harm.

Blood transfusions, if required, should be given in massive doses or often repeated. Giving a pint of blood to one of these desperately ill patients is somewhat like shooting a pop-gun at an elephant.

We drain all our cases in which frank pus is present.

With this systematic method of treating these grave cases, our mortality has dropped to close to 10%. This is excluding moribund cases, in which cases one does well to save 10%.

Mills Bldg.

Case 2 is reported especially because of the fecal fistula into the urinary bladder and the extreme difficulties encountered.

Case 3 is reported especially because the appendix had sloughed away before this sickness began; yet the pathology was plainly of appendix origin.

Cases 2 and 3 are also reported because we know how lucky we were in having them get well.

Anthraco-Silicosis—Statistics from White Haven Sanatorium, Pennsylvania, reveal that tuberculosis of the intestine was found in only 19% of the cases where anthracosilicosis and pulmonary tuberculosis were associated as contrasted to 51% where the pulmonary tuberculosis was uncomplicated by silicosis. This may be due to the extreme pulmonary fibrosis present in these cases preventing the spread of the tubercle bacilli. In early or moderately advanced cases of silicosis the rate of intestinal involvement is the same as in the cases which do not have silicosis. Charr, R. and Cohen, A. C., Am. Jour. Med. Science, 1938, 196.

Cancer Problems Twenty-five Years Ago and Now

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TWENTY-FIVE years ago research workers were seeking "the" cause of cancer. Cohnheim's theory of the presence of misplaced embryonic tissue with prenatal or postnatal cell rest was regarded as universal in scope and was quite generally accepted. Investigation has revealed an extremely wide variety of tissue rest and abnormalities which form the basis of cancer; consequently the scope of our present theories, though not universal, has been proved today to be much wider than some of the early critics imagined. We know now that the Cohnheim theory does not apply to many of the major forms of cancer, for they do not arise from embryonal cells. Again, we are certain there is no specific cause for cancer; rather, there are many causes. Cancer is not a single disease ; it is a group of diseases with many phases but with the common aspect—the destruction of life.

We are still in agreement with the determination that chronic irritation is the most important of all precancerous conditions and the most potent influence in the development of cancer.

Twenty-five years ago many contended that cancer was a disease of disordered nutrition; we have proved that the effect of diet lies only in the lowering of the general body resistance through the absence of sufficient minerals and vitamins.

Again the influence of heredity on the occurrence of cancer was generally believed to be fairly certain, although it was not understood. Now we know the vast majority of cancers are not inherited. Some of the less common tumors, however, are strongly influenced by hereditary tendencies, i. e., glioma of the retina, neurofibromatosis, and so on. The susceptibility residing in peculiar conformation of the organs is likewise a matter of heredity. Whatever the mode of inheritance of the cancer tendency, the condition inherited seems to be a poorly balanced cell system or cells with a high potentiality of malignancy. The condition responsible for the initiation of this process, likewise inherited, may be an endocrine imbalance. The study of cancer in animals, particularly mice, has demonstrated that heredity or genetic influences play a part in the development of cancer in these animals. There are, for example, cancer-susceptible and cancer-resistant strains of mice.

Twenty-five years ago trauma was accepted as a cause of cancer; now it is believed that the traumatic origin of cancer can not be established in a majority of cases and certainly there is no justification for ascribing a single trauma as a cause of cancer unless it can be scientifically proven.

Again, in the past Roentgen ray cancers were frequent. The tragic end of many x-ray and radium pioneers attest to this fact. Now the occurrence of such cancers is rare, owing to improved machines, more perfect technique, and proper screening.

It must be remembered at that time much research in cancer had been done, and definite progress was being made. Of course, the biology of the cancer cell was not so well understood. Today we know that it is a cell with a capacity for unlimited or uncontrolled growth. Whatever may be the contributing cause, malignancy once acquired becomes a fixed character of the cell; the continuation of the condition is not dependent on the factors which were responsible for its development. Attempts to establish fundamental differences between normal and malignant cells of the same tissue type have failed to bring out any striking variation in chemical make-up, enzyme contents, metabolism, or structure. Experiments show that a living body is capable of building up resistance to cancer. What this resistant substance may be is not yet known to scientists.

CARCINOGENIC AGENTS

Twenty-five years ago the known carcinogenic agents were few in number, and their action was not well understood. Now there are more than fifty chemical carcinogenic agents, colantherine being the most active. Carcinogenic agents appear to start a process which may lead to malignancy; but once the process is started, the agents apparently play no further role in the picture. Examples: X-ray cancer, cancer of the skin from external application of coal tar; the disappearance of active virus from papilloma before malignancy appears. In fact, the malignancy may often occur months or even years after the exposure to the carcinogenic agent. (2) Almost all if not all, classes of cells may be rendered malignant under the influence of one or more agents. Not only may this be concluded from the fact that among naturally occurring tumors practically all types of cells are represented, but malignancy has been induced experimentally in skin, connective tissue, liver, lungs, stomach, gall bladder, kidney, testicle, muscle, bone, bone marrow, lymphoid cells, the uterus, mammary gland, and other tissues. It may be deduced from this that malignancy is a universal cell potentiality. (3) The expectation that with the method of inducing tumors it would be possible to trace the transformation of normal cells into malignant cells has not yet been realized. In the area of tissue disturbance induced by the agents a new race of cells appear quite suddenly with no apparent graduation.

EARLY DIAGNOSIS

At that time the early diagnosis of cancer was also stressed, dependent upon a painstaking his-

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tory, a complete physical examination, a biopsy, possibly a frozen section, and upon the aid of the x-ray. Now we have in addition Dr. A. C. Scott's shadow test, the combined barium colon enema and air insufflation, transillumination and gradings of malignancy. As a result of increased knowledge both pathologic and roentgenologic diagnosis are also more accurate and dependable. The clinician and the laboratory worker must cooperate to the fullest extent that we may obtain a correct diagnosis and may give a proper prognosis. Laboratory diagnosis covers a wide field; it requires a keen knowledge of the subject in order to properly interpret the findings.

A quarter of a century ago the ferment diagnosis (Abderhalden) for cancer was receiving considerable attention. The technique is intricate, and the outcome of the test depends upon the scrupulous observation of each and every detail, however minute. Now we have more than fifty methods of sero-diagnosis, but most of these require such a difficult technic, and the outcome is so frequently conflicting, that these methods have only a scientific interest. Since cancer in its early state is usualy a local disturbance, and the humoral alterations are generally secondary, it is hardly probable that we are near the discovery of a precocious-sero-diagnosis. Certainly none of the methods to date have proved so reliable that diagnosis can be based on it, nor can negative reactions on the other hand be necessarily diagnosed as negative.

TREATMENTS

Twenty-five years ago one of our most famous surgeons wrote, "The prophylaxis of cancer depends on the early removal of all precancerous lesions and sources of chronic irritation". This surgeon had a gastric ulcer at that time. For many years he had operated upon thousands of cases of gastric ulcers, curing the disease and preventing cancer. Eight months ago he was operated upon for a perforating lesion of that ulcer; it was found to be malignant. A few months later he died. The whole world grieves because of the death of this great surgeon. Now we know, as he knew then, that the ulcer should have been cured immediately as a prophylactic measure against cancer. Today we stress the careful study of all suspicious cancer symptoms and the early institution of intensive treatment. The problem of reducing cancer mortality has become a major problem in public health and preventative medicine.

In those days an operation, whenever available, was the choice treatment of cancer. This applied not only to all cases in which an operation offered a hope of radical removal of all traces of the disease, but also to those borderline cases in which radical removal was excluded by anatomic conditions. In this latter class, after operation, the site was subjected to intensive Roentgen irradiation. The majority of the surgeons then were of the opinion that in all operable cases the knife was the best agent for combatting cancer and agreed that radiation should be used in inoperable cases. Nor have we today any curative agents for many major cancers, that can compete with surgery. With careful preoperative preparation, improved surgical technique, and meticulous post-operative care of the cancer patient there has been a reduction in the immediate operative mortality with a more comfortable convalescense; likewise many more cases are being permanently cured.

Twenty-five years ago the Percy treatment of inoperable cancer was held in favor by quite a large number of surgeons. Percy used an electrocautery with a controlling rheostat. Percy demonstrated that by this means heat penetrated deeply into the cancerous growth, and by a slow cooking process, it destroyed cancer cells beyond the coagulated tissue without destroying the normal structure. Many surgeons resorted to the treatment. Now Percy is one of a few who continues this form of treatment. He is still an active cancer surgeon at eighty years of age .

In those days we were proud of our x-ray machines. The high-vacuum hot cathode type of x-ray tube was used. Of course, the curative effect of x-ray was vigorously assailed by many authorities; few medical men of experience had faith in its use. The large proportion of recurrences showed that previous dosages were inadequate for all but superficial lesions. Efforts to increase the dose led to disastrous results, to destruction of tissue, to prolonged and painful ulceration, and to eventual recurrence. The proper x-ray dosage and its administration was then an unsolved problem. It was at this time, however, that surface application and the insertion of radium tubes in the cervical canal was begun. Some used repeated applications of light filtered radium over a considerable period. Today our important and essential progress has come through a better understanding of the nature of the disease to be treated. Great advances have also come in the field of engineering with the construction of more durable, more powerful and reliable apparatus. Many new x-ray devices have materially increased the efficacy of the rays. The accuracy of the x-ray machine, together with the increased knowledge of the proper dosage and the best methods of delivering an effective and safe dose, insures maximum therapeutic results. It is even claimed by good authorities that the supervoltage x-rays are curing human cancer that showed no improvement under milder rays. Nevertheless, it is still to be proved that these cure any better than the lower-power rays. True, they penetrate deeper and do not burn the skin so much, but biological "guinea pig" tests have failed to show any curative difference. The tube of the million volt outfit and the two hundred-fifty thousand volt x-ray are the same in principal. Chaoul's low-voltage, short distance roentgen ray therapy is now being used with very good results. This particular apparatus is essentially limited to a voltage range of 50-60 kilovolts. The tube used is long and slender, about the size and proportion of a child's

toy horn. The rays are produced at the tip, in the area that would be the mouthpiece of the horn. The metal disc at the end of the tube is placed directly against the tumor, or at most not more than five centimeters distance. This tube is so made that it can be inserted into most of the body orifices or through surgical openings. Our improved technique of radium therapy under proper screenings and with proper calculation of dosage has given us the desired results without the after effects of over-radiation. Now with interstitial radium and radon seeds, the source of radiation can be placed in the tumor itself, and good results can be expected.

Twenty-five years ago many surgeons treated cancer of the breast by removal of the ovaries; now the ovarian function is destroyed by radiation to stay the ravage of cancer, and I have seen some very favorable results following this treatment. And the results of experiments with new methods of radiation, artificial radioactive substances, and neutrons are awaited hopefully.

Now we have only surgery, x-ray, and radium as curative agents against cancer. Technical improvements have made all of these agents more successful in combatting the disease and new procedures being used now result in the cure of cancerous conditions which were not attempted twenty-five years ago; such as those involving the brain, larynx, lungs, and thoracic-esophagus.

CANCER RESEARCH

Twenty-five years ago I received training in the cancer porblems at the Memorial Hospital for the Treatment of Cancer and Allied Diseases in New York City. It had a new home at that time; it was well equipped, and it had the best cancer experts obtainable; it was then as now the outstanding cancer institution of the world. Patients received careful examinations and expert treatment; those of us who were working in the institution felt we were receiving "the" best training in cancer problems. Now its new building has been completed and equipped with the most modern appliances to deal with the problems of cancer. As seen today the institution in its acknowledged preeminence in the cancer field of the world is an amazing evolution. Here graduate medical education is given to every visitor, even though he may be there only for a day or a week. A three years graduate medical course is given to physicians preparing to make the cancer problems their life's work. The Federal Government has also set up a fellowship system under the National Advisory Cancer Council of the National Institute of Health of the Treasury Department that qualified men may learn the cancer problems of today at the expense of Uncle Sam.

Twenty-five years ago cancer research received little financial encouragement; now millions of dollars are donated, both by the Federal Government and by private philanthropists, to finance important scientific investigation. As a result of an act passed by Congress, $750,000.00 was appropriated for the National Cancer Institute now being built at Bethesda, Maryland; it will be ready for use within this year. In addition $700,000.00 is to be appropriated annually for expenditure in the campaign against cancer; of this $400.000.00 was made available, $200,000.00 for the purchase of radium. The other $200,000.00 is for private cancer research projects. The government owned radium is loaned to various hospitals which are properly equipped to treat cancer patients and for research work at the National Cancer Institute.

SPREAD OF KNOWLEDGE

It was just twenty-five years ago that a movement of widening scope was set in motion by the newly organized American Society for the Control of Cancer: (1) to educate the laity to recognize the early signs of the major forms of cancer and to seek medical advice quickly, (2) to educate physicians to recognize the significance of these early signs and symptoms in their relationship to cancer, (3) to see that proper facilities for diagnosis and expert treatment of cancer were made available for everyone. In the beginning the medical societies in many states would have nothing to do with this program. But now, with cancer committees in every state in the union, it must be admitted that the present cooperation of the medical profession in the education of the laity and physician, is one of the triumphs of the Society. The American College of Surgeons assumed the task of providing facilities for the diagnosis and treatment of cancer, by establishing 307 approved cancer clinics in the larger hospitals of the United States and Canada. This approval by the College means that representatives of the College have visited these hospitals, have consulted with the members of the staffs and administrators, and have furnished to the College a summary of the activities of each hospital with regard to the facilities for the diagnosis and treatment of the cancer patient. The efforts of the medical profession and the laity to control cancer has never been so well organized nor so active as it is now. Great progress has been made in the cancer problems as here-to-fore enumerated, but in spite of all of this we face a very serious cancer problem, i. e., the ever increasing death rate from cancer. Year by year, there is a substantial increase both in the number of deaths and the death rate from cancer as shown by the Department of Commerce, Bureau of the Census, Washington.

DEATH RATE

Twenty-five years ago the Bureau of the Census reported 42,464 deaths from cancer, with an estimated death rate of 76.9 (per 100,000 estimated population) in the registration states. Now the latest report of the Bureau of the Census is for 1937. There were 144,774 deaths from cancer, with an estimated death rate of 112.0 (per 100,000 estimated population) in the continental United States. These statistics are indeed disconcerting. Is this

an increase in cancer or merely an increase in accurate diagnosis? It is my opinion that there is an actual increase, therefore I say, now we have a real cancer problem: how can we reduce this increasing mortality?

15 East Monroe.

One-third of a Century of X-ray Progress

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IT must be remembered that the science of roentgenology is but forty-three years old, with many vital and important developments and discoveries yet to come. But in this short time, Radiology, the baby of all specialties, has become a fundamental part of medical knowledge. No other specialty or agent has so vitally affected and interwoven itself into modern medicine as has radiology.

I speak from personal experience when I trace the development of this all important specialty. It has been my good fortune to "grow up" with radiology, for it was the year I entered medical school, 1898, that Madam and Pierre Curie discovered radium—and just three years earlier, x-rays were discovered by Professor William Conrad Roentgen of the University of Wursburg. My entire medical life has been closely associated with the development and application of these two agents.

X-ray practice in the Southwest has developed from the crude glass plate static machines of the early nineties to present day diagnostic and therapy equipment mainly because the physicians of the Southwest have very generously supported their laboratories and insisted upon the latest and most modern equipment for their patients and research. The development of x-ray laboratory equipment is quite forcefully illustrated by the following lines taken from the issue of the *Journal of the American Medical Association* for March 7th, 1896, which reads, "The electrical apparatus is so expensive, $100 and upward, that few surgeons can use it as yet in their private practice." Those of my colleagues who are actively engaged in x-ray diagnosis, therapy and research will bear me out when I say that a modern laboratory set-up costs at least $20,000.

DEVELOPMENT OF X-RAY

But now, go back with me to 1903 and the first practical uses of x-ray. Like many others, I began my work with a glass plate static machine. Well do I remember spending my Sundays cleaning, polishing and drying out the calcium chloride so as to have everything in shape to work Monday morning—and believe me, if it did work, we were happy. There were many times when the output of high potential current was disappointing. The gas tubes of the early years with their solid platinum anodes wese a source of great worry. But lucky indeed were the men who had a good supply of these tubes stored away as relics when, during the World War platinum became so valuable. When machine and tube were just right, it was possible to develop a current capacity of one hundred kilovolts and about one milliampere, quite a contrast from the five hundred milliampere machines of today. There were of course no meters or way of determining output.

Following the static machines, the induction coil was used as a source of energy. Our first induction coil, a 20″ Scheidel, was purchased in 1905. With this we got our first x-ray burn, and that in making a picture. From that day to this we have been on guard against a repetition. We were still working without any means of measuring the output of x-ray and I frequently looked at my hand with the fluoroscope as a guide to the length of exposure.

In 1907, Snook introduced the cross-arm type of rectification which made it possible to obtain an energy output of one hundred kilovolts and one hundred milliamperes. In 1915, meters for measuring current were introduced into the circuit. In 1914, the Kenotron hot cathode type valve tube was introduced and this is the type of rectification in use today. It permits the high potential current to flow only in one direction. On some therapy machines a hot cathode suppressor type tube is used on the primary circuit. There have been two principle types of x-ray tubes, the early gas tubes and the hot cathode tube developed by W. D. Coolidge in 1914. This is the tube in general use today, and the ability to control and regulate the output of this tube has placed the use of x-ray on a scientific basis. It is now possible to duplicate results of one laboratory in every other laboratory. In fact, the radiologists speak not only a national but an international language.

The fluoresence of the platinum cyanide of barium crystals which led to the discovery of x-ray, has played a very important part in their development, and as the reflecting agent in the fluoroscope, has simplified many x-ray procedures. As a means of shortening exposures, reflecting crystals usually in the form of calcium tungstate have been of great benefit in the form of intestifying screens when used in conjunction with plates or films.

I quote from Roentgen's original communication on the advisability of making permanent records of x-ray findings. "Of special interest in many ways is the fact that photographic dry plates show themselves susceptible to x-rays. We are thus in a position to corroborate many phenomena in which mistakes are easy, and I have, whenever possible, controlled each important ocular observation in

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fluoresence by means of photography." This advice is as good as when the x-rays were discovered. The plates used in early work were followed by films of cellulose nitrate and following some serious fires in which gas caused some deaths, cellulose acetate films were perfected and today we have a film that may safely be stored in hospitals and offices.

Mentioning only a few of the high spots in radiologic diagnosis, we note the work of Professor Pupin of New York, who in January, 1896, was able to make an x-ray picture of a case of multiple gunshot wounds of the hand. The exposure time was one hour. In the early days as much as four hours was required to make a picture through the thicker parts of the body. Almost from the beginning, improvement was noted in the quality of bone pictures and in a few years very creditable bone pictures were being made. All published reports were, however, a part of surgical systems and appendices to systems of surgery. It was not until 1921 that Baetjer and Waters, radiologists, published the first book in the United States on "Injuries and Diseases of Bones and Joints."

By 1902 urinary diagnosis had taken steps distinctly forward. Caldwell introduced the dilated bag for compression, and Albert Schonberg the tubular cone, both being aids in elimination of secondary radiation. The greatest step in this direction was accomplished by the introduction in 1916 of the Potter-Buckey diaphragm, which today is in general use in taking all the heavy body parts. It is interesting to note that beginning with 1904 the following media were used for pyelography: Emulsion of bismuth, collargol, argyrol, silver oxide and silver iodide. The period 1920-30 was destined to see a momentous advance in the development of urologic roentgenology, which, together with the radiology of the respiratory passages and the biliary apparatus, had entered into what Waters had aptly termed the "injection era" of diagnosis. Skiodan and Uroselectan intravenously gives much information in hydronephrosis, renal tumors, anomalies, calculus and tuberculosis, but has not by any means replaced the standard retrograde pyelography.

In 1902 H. Hulst exhibited the first x-ray of a chest made in the United States without an intensifying screen. From that time on, chest radiography and interpretation improved. It was considerably popularized in 1915 when H. K. Dunham's stereoscopic albums of the chest was placed on the market. The 1920's saw a big impetus to chest radiography, largely because of the great amount of materal resulting from the "flu" epidemic of 1918 and 1919 and the return of soldiers gassed in the war. The introduction of iodized oil into the tracheo-bronchial tree did much to place the diagnosis of bronchiectasis on a radiological basis. Much work was also done during this period on the diagnostic segregation of childhood tuberculosis.

In 1908 S. Lang described his technical procedure for the visualization of the mastoid cells. The decade 1910-1920 recorded an appreciable increase of efforts furthering the roentgenologic study of the skull and accessory sinuses. Many different techniques involving various angles and positions were worked out during this time.

The dental application of the roentgen rays made an early beginning and was confined largely to uneruptions of the second dentition and to malposition with particular reference to impactions of the third molars and apical shadows. The x-ray amplified the birth of the crusade on dead teeth so ably fostered by Dr. Rosenow.

Probably by reason of its comparative ease of access, the esophagus was indicated by the early writers as the first objective in their diagnostic attack on the alimentary canal. For visualization, at first metallic sounds, then rubber tubes filled with shot, spiral wire and the like were introduced into the esophagus even in the face of possible ulcerative lesions. It remained for Williams to suggest mixing bismuth subnitrate with food. Early gastric examinations were made by filling a sausage casing with a mixture of lead and mercury. After the examinaton was completed, the casing containing the deleterious mixture was withdrawn. About all that was accomplished by this method was to outline the greater curvature. Later this technique was improved by a deglutible gutta-percha bag into which a solution of plumbi acetate was poured. This was aspirated after the examination was completed. From this feeble beginning x-rays have advanced to the number one position in the diagnosis of gastro-intestinal lesions, ulcera, spasms, cancers, diverticuli, polyps, anomalies—all come within the realm of the radiologist.

The year 1910 introduced the era of gallbladder diagnosis in indirect as well as direct methods. The occasional skiagraph of a gallstone stimulated the work in this field and a diagnosis of gallbladder disease was often made on deformity of the duodenal cap. The value of these reports was both damned and praised, and it was not until Grahm Cole, Cophet and Moore in 1924 introduced the method of cholecystography as we know it today, utilizing the function of excretion. In the case of the biliary organs, the radiopaque material is exhibited either perorally or intravenously, sodium tetraiodophenolphthalein being the agent generally used. This dye is excreted in the gallbladder and performs the combined service and disposition of gallstones secondary one of visceral size, contour and position. This test is today regarded as invaluable in the diagnosis of gallbladder conditions.

Roentgenologic interest in the question of female pelvimetry grew steadily during the decade of 1910 and 1920. With special reference to determining the relative relations between the female pelvis and the size and position of the foetus, and we might also add the number of foetuses. It was during this period also that the introduction of radio-opaque substances into the uterus and fallopian tubes was first begun.

Improvement in cardiac diagnosis multiplied during the years from 1920 onward, resulting in exhaustive studies both anatomic and physiologic as well as of morbid conditions among them volumetric measurements of the heart, sizes of the auricles and ventricles, position and condition of the heart and great vessels, and today even the great vessels and chambers of the heart may be safely outlined by the injection of a solution of diodrast.

The important procedure of ventriculography, encephalography and injection of the spinal cord initiated by Dandy has been eagerly followed up in the period from 1920 to the present.

Each year sees new uses for the x-ray in the diagnostic field, with refinements and improvements in the old methods. The marvels introduced by the injection era promise many surprises for the future. Undoubtedly some injection techniques, such as outlining the blood vessels and the reticulo endothelial system, may yet be brought into general use.

X-RAY IN WAR

In view of what threatens to be another occasion to make the world safe for democracy and which safety calls for localization of a great many bullets, shell fragments and pieces of splintered bones. it might be well to briefly review the military roentgenology. We are told by Glasser that the Italians were first to apply the rays in war times in 1896. The British used the rays quite extensively in the Boer War, 1899 to 1902. We had very little use for the x-rays in the Spanish War, but beginning with 1914 the medical department of the American army under Maj. William A. Duncan developed a portable x-ray outfit that operated from an electric generator driven by a gasoline engine. There were several of these outfits in this section at the time our army went into Mexico looking for Villa. From this crude beginning more elaborate outfits were designed for the World War No. 1. The greatest use to which these units were put was the localization of foreign bodies. Many ingenious methods were devised. For the most part they were all modifications of triangulation, the more rapid methods making use of the fluoroscope rather than the plate. While but a few of the men trained at Camp Greenleaf ever saw duty at the front, it is said to the credit of the experienced men who did go over and were on duty that very few ex-service men have come to civil hospitals since the war with bullets or shell fragments in any surgically accessible part of the body. Our own experience in bullet localization on a large scale was during the Madero revolution in Mexico. After the battle in Juarez and the fall of the Diaz government, we took a portable Rose coil across the river and made many pictures of wounded men. Our equipment was such, however, that localization by means of triangulation was not attempted. Some of the more important officers were brought to El Paso hospitals, and more accurate work was done on them.

X-RAY THERAPY

Advancement of therapy in x-ray to be complete must also include that of radium, as the two agents are so nearly identical in their action. Irradiation therapy has passed through four distinct phases:

1. The era of enthusiasm—1896 to 1906.
2. The era of suspicion and distrust—1906 to 1914.
3. Scientific application of rays—1914 to present time.
4. The recognition of radiology as a specialty by the American Medical Association; the establishment of a national board of examiners—1933.

First following its discovery, x-rays were used for treating practically every chronic condition known. The literature was filled with glowing accounts of cures, all unsupported, of course. The theories as to the mode of action were numerous and all were empirical. At the height of this era, in 1906, there were over 3,000 machines in operation in the United States, but with the improvement in mechanical construction and the introduction of the induction coil as a source of energy, more x-rays were produced and serious burns began showing up in large numbers. This led to a marked reaction, and the public and physicians in general turned from x-ray, and it was in disrepute as a therapeutic agent. This era extended to about 1914, when the few scientific physicians such as Pusey, Allen, Pifford, Stellwagon, Pancost, Pfahler, Williams and others served to keep therapy alive. In 1914, with the development of the Coolidge tube and the further addition of instruments of precision for measurement, the art of therapy was established on a scientific basis, and upon which it still operates, having added many refinements to these basic principles. Early therapeutic x-rays were used only for superficial work. Protective measures were necessarily established to protect the patient, and we are today still using to a certain extent the same protective measure, lead. As the skin absorbed too many of the soft rays, filtration was introduced in this country by Dr. Pfahler, and this lead toward the use of deep x-rays. The first filter was leather. With the increase in the machine voltage, filters have been gradually added to until today aluminum, copper and tin are all in general use. Today relatively large doses of x-ray and radium can be administered to a considerable depth without injury to the skin. All early measurements were made by spark gap, but that, too, has progressed to a fine point, and today the x-ray entering a patient is registered on the instrument panelboard by a system of radio tubes so that the operator knows at all times just what is taking place. All high tension currents have been eliminated, and the present-day equipment is shock proof.

In the treatment of benign tumors and inflammatory conditions, x-ray has many uses. As an agent in the treatment of cancer it stands with its ally, radium, and with surgery as the only two recognized treatments for that dread disease.

If I were to look for a single factor responsible for the phenomenal progress x-ray as a diagnostc

agent has made in the past 43 years, I believe it would be "visualization." The thought is rather well stated in an old Chinese proverb: "One hundred telling are not as good as one seeing." Omar expressed the same thing for the ancient Persians by saying: "Seeing is believing." And the American phrase is: "I'm from Missouri . . . show me!" Layman and physician alike still continue to prefer the visual conception of their problems.

I always like to think of x-ray therapy as a three-column army. In the center is the physician, the right column is composed of the electrical engineers, and the left column is composed of the physicists. It has been the closely co-ordinated efforts of these three columns that has placed radiology where it stands today.

Roberts-Banner Bldg.

Pediatric Progress During the Past Twenty-five Years

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THE *Journal of Pediatrics* carries an article every month on Pediatric Progress, under the title "Critical Review"; so you can readily see how impossible it is to cover twenty-five years in twenty minutes. Twenty-five years to a geologist or a historian is but a watch in the night—in medical progress at some periods it has been less than that; but since the organization of our society, much has happened and many important advances have been made.

In 1914, there was not one man in all the territory covered by this society who limited himself entirely to pediatrics. Now according to the last directory there are twenty-three who either limit or pay especial attention to this line of work.

The American Pediatric Society has only been in existence for half a century. The membership is largely composed of teachers and is limited to invitation. The American Acâdemy of Pediatrics hopes to enlist all the reputable men who do pediatrics; their membership is limited to those who have passed and been certified by the American Board of Pediatrics. These organizations have contributed largely to the aggregate of pediatric knowledge; they have stimulated research and have cooperated effectively in the elevation of standards and of practice. They have encouraged the organization of many agencies dedicated to the betterment of child welfare.

The beneficial and humanitarian influence of these organizations, together with that of our own society, may be seen as we review some of the progress of the past twenty-five years. The function of all medical organizations is to stimulate study and elevate standards to the end that disease may be prevented and suffering relieved.

It is interesting to reflect on how the solution of one problem leads to another. For instance, the old text books had much to say about tetanus in the newborn. Dr. Mendelson tells me that in the hospital in Bangkok, Siam when he was there they averaged about one case of tetanus a day in babies who had been delivered by some old native woman and brought to the hospital to die. It has been almost forty years since I received a diploma stating that I was a Doctor of Medicine, and I have yet to see my first case of tetanus in the newborn. With hospitalization tetanus and what was formerly spoken of as child-bed fever are now practically unknown; but with the grouping of babies together, we see many cases of impetigo and hear frequently of nursery epidemics, some of which have been very serious. These epidemics have occurred in some of our largest and best hospitals. The nursery problem is one which has not yet been solved, and which must be solved. I heard Dr. Abt make the statement that it had taken fifty years to educate the public to hospital obstetrics, but that if this question was not soon solved it would be back to the homes in no time.

In the year 1909, the Society for the Study and Prevention of Infant Mortality was organized. They estimated that at that time there were over 300,000 deaths per year in an infant population of 1,500,000. There were more infant deaths from diarrheal diseases during July, August and September than occurred from all causes in the other nine months. We have seen that high curve flattened out and now the peak of infant deaths comes in the winter months from respiratory infections.

A study was made near Albuquerque in the Atrisco area. Atrisco is a small community about two miles wide and three miles long, with the Rio Grande river on one side and a high bluff on the other. In 1936 there were eighteen deaths in this district from bacillary dysentery. During the winter of 1936 and '37 they built sanitary privies for every home in this district and the public health nurse went from home to home and explained the importance of using the privies and the necessity of keeping the seat covered and the door closed. The following year there was only one death from dysentery in the district, and that child had had a positive dysentery the year before and had carried the infection over until the next season. With that alibi they had a clear slate, and so discovered what we have always known—that unhygienic and unsanitary conditions permit dysentery to flourish.

The anxiety of the mother to make her children keep ahead of the standard height and weight charts has caused many children to be over-fed and this stuffing process has brought us another prob-

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lem. How often do we hear the mother say, "Doctor, my child won't eat". The wide dissemination of these height and weight tables has caused much maternal and paternal unhappiness. It is hard to make parents realize that these tables are only an average, and that a child may be perfectly healthy and still be considerably under or above the figure on the chart.

Kidney conditions have not been satisfactorily classified. However, Aldrich, Bilderback and many others have helped some by separating the nephroses or degenerative processes from the nephrites or inflammatory processes. Yet there are those who contend that the degenerations are the result of inflammation.

Another problem that is being passed on to us by the obstetrician requires considerable thought. The obstetrician desires to make childbirth painless by the use of sleep-producing drugs, and to shorten labor by the use of pituitary extracts of one kind or another. But in Bundeson's report of autopsies on a large group of babies who died in the neonatal period, he states that a large percentage of them showed intracranial hemorrhages, and a high percentage of the mothers had had pituitrin.

Dr. M. Edward Davis from the Chicago Lying-in Hospital told us that they believed that it would have been better had pituitrin never been discovered. Dr. Fred Schreiber of Detroit made a study of 500 children with degenerative brain conditions; 72% of these children had not breathed at birth or had had difficulty in breathing during the first few days. One of the effects of the pain relieving drugs given at childbirth is to depress respiration in the mother; this he believes affects the fetus who depends on the mother for oxygen and nourishment. In a group of 100 babies, the mothers of which had been given pain relieving drugs or anesthetic, or both during labor, showed that 77 per cent had difficulty in breathing. The baby that is born in the home before the doctor gets there with his nembutol, seconal, morphine, ether and pituitrin, cries lustily at birth. Let us remmember what I once heard Dr. DeLee say, "Don't do any harm."

The Endocrine treatments have come to the fore. Some have risen and fallen, but many of them are here to stay. George Vincent said, "We teach more about the endocrines than we know". Thyroid of course was used before our time, but insulin is perhaps the most important, and its benefits are great. Thousands of children are living today that would not be without insulin. Before insulin, diabetic mortality in children was about 100 per cent. The ones who did not die, did not have true diabetes.

Many conditions that were not understood, we now know to be of allergic origin. Almost fifty years ago Sir William Osler said there was a relationship between eczema, asthma, urticaria and angioneurotic edema, but he was fifty years ahead of his time, and we now know the truth of what he said then. We have seen the deficiency diseases conquered with a better understanding of the vitamens—pellagra, scurvy, rickets, beri-beri, and if you are sufficiently credulous the detail men will convince you that what Ponce De Leon sought in vain we now have in vitamins. The two new Vitamins add much to the health and happiness of the race. Vitamin J—the Joy Vitamin found in alcoholic beverages, and Vitamin K which stimulates blood coagulation. As we laugh at some of the medical theories of the past, I wonder if future generations will not laugh at us for our child-like faith in the Vitamin.

Since the perfection of the Rammstedt-Fredet operation for pyloric stenosis, most of these cases are saved. Coeliac disease is now in the curable class since the work of John Howland, together with the discovery of Haas that these children could assimilate enough bananas to keep up their carbohydrates.

This period has seen the complete working out of diphtheria. With the new method we can get our culture growth in a few hours. We can now tell if a child is immune, or if the child has been exposed and is susceptible we can give a small dose of the antitoxin and prevent infection. If the child already has diphtheria, we can neutralize the toxins with antitoxin and the child will get well. With toxin-antitoxin or toxoid we can confer an immunity.

We have seen the cause of scarlet fever discovered and the Dick test perfected. The convalescent serums have been perfected and their worth proved. I have used it in several severe cases—and I mean the ones with a temperature of 105 when you first see them—and saved every one of them. If you can get your convalescent serum in time, I believe you can save every case of scarlet fever.

With the discovery of sulfanilamide, prontosil, neoprontosil, prontylin, and sulfapyridine, we have an entirely new armamentarium; as these fit into almost all types of practice. We will hear much more about them from other angles, so I will pass them hurriedly and not give the time to which they are entitled. I heard John Toomey of Cleveland, who is a "doubting Thomas", say that sulfanilamide was the only remedy that had ever been offered for erysipelas that would shorten the course of the disease. At the A. M. A. in 1937 I was sitting beside an Irish friend and after we had heard about five papers on sulfanilamide giving a list of all the diseases they had cured, including almost everything but warts and ingrown toenails, he whispered to me and said, "My God, Wylder, that stuff's as good as mercurochrome used to be!"

With sulfapyridine we have a weapon against pneumonia the like of which we never even dreamed. Charles Hendee Smith of New York, who led a panel discussion at the St. Louis session of the A. M. A. last spring, said that some of the houses were going to discontinue the serum because the call would almost disappear, since you could cure

a case with sulfapyridine for a small fraction of the cost of serum.

Johns Hopkins reports 72 consecutive cases and no deaths. St. Louis Childrens reports 77 cases with one death, and the alibi that the one who died was an advanced case when brought to the hospital, and there are many such reports. I have had 7 cases and saved them all—so we feel like that old philosopher who cried, "Eureka, I have found it".

As we look back on the first meeting of this organization that was held in Albuquerque—Warner Watkins was there from Phoenix; Butler was there from Tucson; Drs. Rawlings and Vance, I believe, were there from El Paso, and that was about all except our home boys, and most of them stayed in their offices; we have seen many valuable aids to medical science develop, and I feel that this society has been a great stimulus in this development, and I am proud to have been associated with such a fine bunch of fellows.

221 W. Central Ave.

Growing Interest in Heart Disease in the Southwest

(Since 1915)

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WHAT happened in the last twenty-five years, sprang from medical events of an earlier date. Cardiac pathology was largely an unexplored field up to the time of Heberden, Hunter, Parry, and Jenner. True, William Harvey, in 1647 had made the earliest observation on cardiac rupture. "His patient, a nobleman, had often suffered with paroxysms of oppressive pain in the chest". He died in one of these paroxysms. The left ventricle was ruptured with an opening sufficient to admit a man's finger. Harvey made no attempt to explain why.[1]

Jenner was the first to ascribe angina pectoris to calcification of the coronary arteries. He predicted that this was the cause of John Hunter's angina. Autopsy proved this to be correct. But coronary thrombosis and cardiac infarct were overlooked for another century, attention of pathologists having gone astray on the theory that cardiac rupture, fibrosis, and aneurysm were due to rheumatic inflammatory changes, endocarditis, peicarditis, and myocarditis.

Finally Prof. Carl Weigert, in 1880, and Dr. Karl Huber, 1882, described many cases of cardiac rupture and aneurysm, and were the first to clearly and accurately set forth the gross and microscopic findings in these cases and to offer a tenable explanation between these lesions and obstruction of the coronary arteries (Virchow's Archives). In 1887 John Lindsay Stevens, in a series of lectures reported in the London Lancet described 16 cases of infarction, aneurysm, and fibrosis of the ventricle and rupture, showing the relation of these lesions to coronary sclerosis, with detailed histological studies. But no attention was paid to antemortem symptoms preceding death and no connection had ever been guessed. Finally Osler in his Lumleian lectures in 1910 described many cases of angina pectoris, and in one case remarked that "on account of the severity of the attack, its long duration, the presence of a friction rub, and muffled sounds at the apex," he felt sure that there must have been coronary thrombosis. But it finally remained for Jas. B. Herrick, Professor of Medicine at Rush Medical College, to make careful antemortem studies in three cases and to give the diagnostic clinical symptoms in the main, as we know them today. In one case there was a postmortem, proving the correctness of his opinion. He published his findings in the A. M. A. in 1912. To his great disappointment, his work attracted very little attention, until about 1920, when others began to make the diagnosis, using Herrick's data.

Sir James Mackenzie revolutionized our ideas about heart and pulse irregularities. He also made extensive studies on angina pectoris. His book on Heart Disease appeared in 1912. Maude Abbott's classic work on congenital heart disease appeared in Osler's System of Medicine a few years later. Her writings still remain as the outstanding guide to diagnosis in this field.

The work of Louis Gross on The Blood Supply to the Heart[2], and papers by Jos. T. Wearn, on The Role of the Thebesian Vessels in the Circulation of the Heart and on the Extent of the Capillary Bed of the Heart[3], became landmarks in cardiology, furnishing data for a broad understanding of the mechanism of the coronary circulation and enabling us to conceive how the heart keeps going after occlusion, of one or even both coronary arteries.

The electrocardiograph began to be used in some of the large hospitals in Europe about 1910, but in 1915, there were probably not even a dozen machines in this country. While Mackenzie had taught us how to recognize most cardiac irregularities by physical examination alone, still the electrocardiograph is almost indispensable in auricular flutter, bundle branch block, some cases of acute coronary obstruction, and auricular fibrillation. Strange to say, the rank and file of the profession have more trouble in recognizing the six common irregularities than in being sure about coronary obstruction. The mere possession of an electrocardiograph does not solve all the problems

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of cardiac diagnosis any more than a blood pressure apparatus can tell us all about essential hypertension. The electrocardiograph is of relatively little use in clearing up the diagnosis of coronary sclerosis or simple angina pectoris.

From 1917 to 1923 the number of cases that were reported as coronary obstruction slowly increased, and the value of the electrocardiograph in diagnosis became more and more apparent. Still the vast majority of doctors had taken very little interest in the subject. This is indicated by the fact that when Dr. W. W. Waite and I presented the paper on Cardiac Infarct and Coronary Sclerosis at the meeting of the Texas Medical Society in 1925, in which 8 cases were reported and postmortem specimens presented, there was but one man in the audience ready to discuss the subject. This paper was considered of enough importance at the time to be referred to, in the *Boston Medical and Surgical Journal*, in a review of the progress of cardiology for that year.

WORK IN EL PASO AND PHOENIX

In 1924 Dr. Hugh Crouse installed the first electrocardiograph in El Paso, and probably the first in our territory. Mr. Joe Wallack, who had been thoroughly trained in the army for three years, was put in charge of Electrocardiography and basal metabolism. The writer bought his own first electrocardiograph in 1927. Eleven years ago Dr. Paul Holbrook installed the first electrocardiograph in Tucson. At the present time there are seven electrocardiographs in that city. There are only two doctors who give a large part of their time to cardiology. There are five electrocardiographs in Phoenix. The first one was installed by Drs. Fred Holmer and Victor Randolph in 1928. There were a considerable number of doctors in that vicinity having trouble in diagnosing cardiac irregularities, but most of them have little trouble in diagnosing acute coronary obstruction. However, many are still too lax in enforcing complete rest. There is a growing interest in circulatory diseases in Phoenix. In Albuquerque there are four electrocardiographs, three of them in hospitals, and one private. There is growing interest in the subject. Dr. Robert Brown of Santa Fe installed an electrocardiograph on one of the hospitals at Santa Fe which is at the disposal of any doctor wishing to use it. There is an increasing interest in cardiology and pathology in that city. Dr. F. H. Crail of Las Vegas had the first electrocardiograph in New Mexico. There has not been much interest in cardiology among the older doctors there, but the recent graduates recognize cardiac pathology much better.

A cardiac clinic has been operating in El Paso since 1920. For the first nine years, the writer was in charge, and Drs. Duncan and Rheinheimer did excellent work. Since then, the clinic has been operated under Dr. John Morrison, at the County Hospital, with a large attendance.

In 1923 Dr. Waite organized the El Paso Pathological and Post Mortem Club, which was a great success. Two hundred postmortems were done the first year, and something like two thousand five hundred in all. It was a great opportunity for those interested to get first hand information.

AUTHOR'S EXPERIENCES

In my own practice I've had four cases of ruptured heart, three of them doctors. The first doctor thought he had gallstones, and said he had had many attacks before, just like this. He dragged around for six weeks before coming to El Paso, and died the next day. Postmortem showed a very large heart with a clot passing through the ventriclular septum, from the left to the right ventricle, and a large infarct about the left apex. There were no gallstones. Evidently he had angina pectoris all the time.

Another doctor, age 79 years, died from a small rupture due to recent infarct, at the extreme left apex. Evidently he had been going about unconscious of what was the matter. The recent clot was super-imposed upon an old scar. The third doctor had been treated some six weeks before for angina pectoris, and never been confined to bed. On going up stairs to his office, he had a violent pain, and went into collapse, and died a few moments later. Post mortem showed a rupture of a large scar in the upper posterior left ventricle.

The other case was a soldier, 59 years, who had suffered several days with pain in the chest, but had continued to work digging in the yard. He was sent to Beaumont Hospital where he died a few days later. There was a rupture of the left ventricle at the apex.

In the early numbers of the *American Journal of Medical Sciences* there are many reports of patients dying suddenly of angina pectoris, and in a large per cent there was rupture of the heart. The same is true of the cases of Weigert, Huber, and Stevens, previously discussed, of course no antemortem diagnosis had even been made up to 1912. I think all this evidence points very claarly to the necessity for immediate, absolute and prolonged rest in the management of acute coronary obstruction.

I have had about eighteen cases of acute coronary obstruction under observation, from the time of recovery up to the time of death. A man 49 years old, manager of a large insurance agency, was seen on January 23, 1924. His attack was very severe, vomited a large amount of blood and had to have large doses of morphine and finally chloroform to relieve the pain. There was a friction rub over the heart. It was five months before he was able to go to California to rest, and finally resumed his work. About three years after recovery, he and his wife made an auto trip in a Model T, camping every night. The trip included the Grand Canyon, crossing at Lee's Ferry, then to Zion Canyon, Southern Utah, Yellowstone Park, Western Canada, East to Quebec, and finally down to Florida and back to El Paso. He stood the trip well, taking good care of his diet. He did all the driving. Later he made

a similar trip and when he came back, he had gained 20 lbs., and seemed in perfect health. He said in a boasting way that he had done what he pleased on this trip, ate anything he liked and as much as he wanted. Two days later he came to see me in great pain, so much so, that it took at least three hours to get him at all comfortable. The electrocardiogram showed T inverted in leads 2 and 3. He recovered in about a month, and two weeks later he went back to work. In November, 1938, he planned a trip to Gallup, N. M. He finally arrived, after a good deal of dyspnoa on the road, and died the same night, after a heavy supper.

Certainly in this case, altitude was not so dangerous as we are led to believe in these days, when anoxemia and coronary flow are discussed so much. The question of altitude is an individual matter, and can only be decided by careful trial.

A second case of great interest was that of a railroad passenger conductor. The attack, June, 1924. Absolute rest for one month, rest at moderate activity for another month, returned to his old job. His weight was reduced from 240 to 190 lbs., and he felt better than before his attack. He died in 1932, age 70 years. Postmortem showed a scar of good thickness in the upper posterior left ventricle about an inch in diameter, and with the heart muscle in very good condition. There were abscesses in the left kidney, gallstones, and a very large stomach ulcer about an inch and one-half in diameter. He had an uncontrollable hemorrhage from the stomach, and this was undoubtedly the cause of death.

I think this case teaches that after infarction, the heart is not necessarily hopelessly damaged. Some 60 or 70 per cent are able to return to their work, the only caution is discretion in eating and exercise. The diet should be low in fats, and the overweights should reduce. Sensible exercise will improve the heart muscle. Exercise is the one sure way to increase the coronary flow, just as we increase the blood flow in the skeletal muscles and build them up. But care should be taken not to overdo and begin gradually. Exercise is not often the precipitating cause of acute coronary obstruction. In 890 cases studied by Master and his associates it was found as a cause in only 2.2 per cent.

My impression is that prognosis after acute coronary occlusion is not so bad in the aged as one might think. Mrs. G., age 85 years, overweight and eating too much, quite active, mentally alert, was seen November 9, 1935. Three days before she had a violent pain in the epigaric area. It went no higher. Pain stopped and returned next day, going above the heart in the midline; temperature 100 degrees; B. P. 108/70; pulse regular 70. Heart sounds almost inaudible. No pain. Cheyne Stokes respiration. Put in bed four weeks. Good recovery. She is living and fairly at 90. She made trips to Houston and is now in Los Angeles. She has felt about as well in El Paso as at a lower altitude.

So far I have discussed chiefly angina pectoris and cardiac infarction, because I have seen considerably more of these ailments. In this part of the Southwest we have seen all kinds of heart disease. In our clinic we saw a good number of children with rheumatic heart lesions. Syphilitic aortitis is often seen. Formerly we saw an excessive number of children with hereditary syphilis but it is much less common now. The hereditary type rarely causes aneurysm or heart disease. Congenital heart defects are quite frequent. We have seen two children with congenital heart block.

Roberts-Banner Bldg.

BIBLIOGRAPHY

1. Rupture of the Heart; Report of Forty Cases. Benson, R. L., Warren, C. H., Manlove, C. C.: American Journal of Pathology, Volume 9, May, 1933.
2. Paul B. Hoeber, N. Y., 1921.
3. Journal Experimental Medicine, Feb. 1, 1928.

ATTEND YOUR ANNUAL SESSION!

■

ARIZONA STATE MEDICAL ASSOCIATION

Tucson
April 18-19-20

■

NEW MEXICO MEDICAL SOCIETY

Albuquerque
May 27-28-29

SOUTHWESTERN MEDICINE

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ALCOHOL AS A BEVERAGE

Long overdue is an impartial, objective, hard-headed study of the real effect of alcohol on the various tissues of the human body at rest, at work, at play. For some reason this question has always been clouded by the hate type of statements, on the one hand by the so-called moral interests, and on the other by the vested interests with a monetary stake in the answers.

It is well known that small amounts of alcohol may be relaxing, comforting, and in a sense, nutritious. It is likewise well known that few persons stop to think, when taking the evening cocktail, that "just one more" may exceed the pleasant, probably harmless level of alcohol in the blood stream

How much alcohol can a given individual take and still show adequate motor response to various stimuli? The answer to this is important—in these days of high-speed conveyances. Is a glass of wine with a heavy dinner actually helpful to the digestion from a physiological point of view? Or does the feeling of well-being it brings about constitute the real help to digestion? Does a glass of beer slow the driver's mental activities to a point of potential danger? Do 2 or 3 glasses?

Everyone in the wide world has ready answers to the questions above—just as folks once did to the question of how many angels could dance on a pin-point. But, truthfully, aren't these ready answers based on hearsay, on prejudice, on experiences with individual cases, on wishful thinking?

The process of fermentation is as old as life itself. The production of fermented beverages is known to the most primitive of peoples. The art is not likely to be lost to men. Why then, should not man shunt the taboos to the ash heap, and set his brains to the establishment of scientific answers to all the thousand and one questions conjured by the word "alcohol"? Shall his soul be sold to the brewing interests and he thereby be consigned to hell because in his infinite, laudable curiosity he seeks true answers? Shall the town drunkard (horrible example) forever be the standard reply to "what effect does alcohol have on the human body"? Shall laboratory rats forever be the criteria of those who say alcohol is not injurious?

Drinking peoples have contributed most to the civilization of this world—in art, in science, in gentle living. Total abstainers, such as the Mohammedans, have given the world very little from a cultural standpoint. But are these real answers? Are not many other modifying factors to be weighed here?

The confirmed drunkard is a disgusting sight to everyone. But likewise isn't any man who has no self-control because of other reasons? By the same token, the sour-puss, blue-nose can also be rather disgusting to many people. Now isn't there a basis of compromise between these extremes of behavior? That meeting ground will be difficult to establish, admittedly. Let the question be examined with open minds, free from propaganda's taint. Then let the information and conclusions be given wholly and truthfully, as is done in any other scientific investigation.

The American Association for the Advancement of Science is currently supporting an investigative project calculated to furnish just such objective answers as the world needs. The final report should be highly significant.

GERMANY'S PLIGHT

Discounting heavily as one must information of conditions abroad, there still remain impressive indications that the health of the German people is in a sorry plight. Beginning several years ago with the rigid regimentation of German physicians, the gamut of tragedy now approaches the critical phase. Following regimentation in the service of the State there came expulsion for many of the most brilliant scientific minds. Then war. The demands of the armed services have removed so many German physicians from civilian practice that it is said that there remain about 8,000 to care for 9,000,000 civilians—29,000 physicians having been inducted into military service.

Various reports, many published in German journals, add to the dreadful picture. Suicide rate of the United States is 1.4 per 10,000—in Germany it is 4.1. The incidence of sickness rose 20.3% in 3 years. Heart disease in children has increased alarmingly; the death rate for infectious diseases is one of the highest in the world. Diphtheria mor-

tality is now 4 times that of the United States. A recent survey in Munich showed 96.5% of the school children had rickets. In Hamburg, Leipsig and Munich only expectant mothers and cases of contagious disease are admitted to hospitals.

Medical service in Germany is steadily deteriorating in another manner. The once rigid laws controlling education have been modified to reduce the training period by 2 years and to legalize, without any form of examination, the activities of assorted quacks, faith healers, nature cultists, and the like.

So passes a once healthy, vigorous people into the realm of sickness, physical and mental. Generations to come must surely be marked with the folly of today. The lesson is obvious—regimentation, internecine strife, expulsion, war—and the people pay dearly for a gaudy bill of goods when the tinsel begins to tarnish.

Does America want any part of this tragic sequence? It isn't just coincidence that a free, untrammeled American system of medicine has, during the short life of this Republic, increased the life expectancy of its citizens from 35 years to 62 years!

NORMAL BLOOD PRESSURE

What constitutes normal blood pressure? This, of course, must vary with individuals, with environment, with many other factors. But it is true that a great deal of confusion and uncertainty obscures the possible truth. So many writers have included all extremes of blood pressures in statistical sampling that the higher brackets must increase the general averages.

Robinson[1] has studied the records of 7,478 males and 3,405 females appearing for periodic health examinations in the Chicago area during 1933-34. He found that the males had an average blood pressure of 121 mm, the females showed an average of 117 mm. The average diastolic pressure was 74 mm for the males, 71 mm for the females. But the modal pressure of the group showed the males more frequently had a pressure of 116 mm systolic and 71 mm diastolic, while the females showed 113 mm systolic and 70 mm diastolic. 70% of males and 75% of females had a blood pressure of under 125/80 mm.

Now, eliminating serially various levels of blood pressure over 140/90 mm (arbitrarily set), showed the mean figure for the delimited male group to be 116 mm, in contrast to the mean for the total male group of 121 mm. Similar figures in the female group were 112 mm in the delimited segment as compared to 117 mm in the total female number.

It is concluded that 125/80 mm should be considered the upper limit of normal rather than 140/90 mm. It is stated that blood pressures steadily above 140/90 mm are incompatible with normal life span. Ages of the entire group studied varied from 18 to 80 years.

1. Robinson, S. C., The Range of Normal Blood Pressure; Proc. L. E. Ex. 1:104 (Sept.-Oct., 1939).

BULLS—LIONS—DUES!

A lion had been watching three bulls feeding in an open field. He had tried to attack them several times, but they had kept together and helped one another to drive him off. The lion had little hope of eating them, for he was no match for three strong bulls with their sharp horns and hoofs.

Then one day the bulls had a quarrel, and, when the hungry lion came to look at them and lick his chops as he was accustomed to do, he found them in separate corners of the field, as far away from one another as they could get.

It was now an easy matter for the lion to attack them one at a time, and this he proceeded to do with the greatest satisfaction and relish.

Moral: In unity is strength.

Let the moral above be recalled again to American physicians. The time is once more at hand when annual dues to one's county, state and national societies are to be paid. These societies are magnificent evidence of the unity of purpose of American medicine. And unity in the face of the past two years' attempts to wreck America's system of medicine has spelled the doom of the Crackpots and the Heaven-help-us gang. So pay your dues!

INTRANASAL MEDICATION

Increasing knowledge of the physiology of the respiratory tract seems to support the conclusion that, especially in infants and small children, it is actually dangerous to use nose drops having a base of unsaponifiable oils. In support of this statement it should be pointed out that (1) such oils are not miscible with the nasal secretions, (2) ciliary action of the respiratory tract is markedly impaired by the oil and by most of the commonly used medicaments dissolved therein, (3) records now exist of many autopsied cases of a peculiar type of pneumonia, traceable to the deposition of oils in the smaller air passages of the lungs.

From every standpoint, it seems scientifically sound to discontinue in most cases the use of unsaponifiable oils in the nose, and substitute therefor a physiological solution of ephedrin or one of the newer ephedrin-like synthetic preparations, in a buffered aqueous solvent .

The danger of lipoid pneumonia in infants is a real one. Too many mothers yet purchase from the drug store a bottle of the much advertised junk ballyhooed so widely and fill baby's nose at the first sign of sniffles. It is the duty of the family physician to warn his patients of the potential dangers of such a practice.

CORRECTION

Due to the frailties of mice, men, proofreaders and editors, two face-pinking mistakes were blazoned in the cold type of the January issue. They were:

(Continued on page 71)

Special Section

Arizona State Medical Association

PRESTON T. BROWN, M. D., *Associate Editor*
403 Professional Bldg., Phoenix, Arizona

NECROLOGY

KIMBALL BANNISTER, M. D.

A tragic automobile accident on the early morning of January 29 claimed the life of Dr. Kimball Bannister of Phoenix and that of Mrs. Bannister as well. Dr. and Mrs. Bannister, together with two guests, one of whom was also killed, were returning from the Annual Charity Ball, a benefit for St. Luke's Home, when their car was crashed into at an intersection by a speeding automobile not having the right-of-way. The tragedy threw a pall over the community which knew Dr. and Mrs. Bannister so well for their civic and professional activities.

Dr. Kimball Bannister was born at Princeton, Illinois, received his A B Degree from the University of Illinois, and his degree in Medicine from Northwestern University College of Medicine in 1914. His internship was at Cook County Hospital, Chicago, for a year and a half.

Dr. Bannister had been in practice in Phoenix since 1916 and was a member of the County, State, and National Medical organizations, as well as the Southwestern Medical Association, and the American College of Surgeons. In College his fraternities were Delta Upsilon and Nu Sigma Nu.

Civic affairs also claimed the attention and interest of Dr. Bannister. He was a Director of the Phoenix Country Club, the Arizona Club, was a Mason, Shriner and a Jester. Golf was his hobby and in this sport he excelled, having held the amateur championship for Arizona and for the Southwest on different occasions.

He married Elizabeth Davis, also a graduate of Northwestern University, in 1916. Three sons and one daughter survive their parents—Kimball, Jr., John, Mary Elizabeth, and Bryant. The loss to this family of young people is a tragic one, indeed.

The passing of Dr. and Mrs. Bannister is sincerely mourned by their host of friends and civic and professional associates.

CASE REPORT

SCLEROSIS TUBERCULOSIS OF THE THYROID GLAND

H. A. BARNES, M. D.
C. W. SECHRIST, M. D.
M. G. FRONSKE, M. D.
Flagstaff Hospital, Flagstaff, Arizona

Tuberculosis of the thyroid gland is usually incidental to tuberculosis in other parts of the body; it is found more often at autopsy than at operation, but is found sometimes when not suspected in adenomatous goiters and in hyperplastic goiters.

We have but one case to report, and because of our suspicion of malignancy, our attention has been called to the sclerosing type of tuberculosis, and because no other signs of tuberculosis existed elsewhere after thorough clinical study.

Doctors Coller and Huggins[1] in a review of the literature, point to the relative rarity of tuberculous infections of endocrine glands. The prevailing thoughts of middle nineteenth century pathologists—namely, Virchow and Rokitansky—were that there existed some mutual antagonism between tuberculosis and goiter and that the presence of goiter excluded the possibility of tuberculosis. That the number of recorded cases has increased in the last 30 years has been attested to by the fact that routine pathological studies are done on all thyroidectomized patients. The total number at present is not large.

As early as 1917, Mosiman[2] reported nine cases of tuberculosis of the thyroid from Crile's clinic. In 1921 Ruggins[3] called attention to the co-existence of goiter, hyperplasia in ten of the fourteen cases he reported which brought up the question, "Does the thyroid undergo hyperplasia because of the tuberculosis process, or does an already pre-existent moderate hyperplasia lend itself readily to tuberculosis infection"? This is still a moot question, but careful observers lean to the latter thought. Tuberculosis of the thyroid gland can exist without any demonstrable evidence of tuberculosis elsewhere in the body.

The microscopic picture of tuberculosis of the thyroid is typical of that found in other organs of the body. The tuberculous process, however, can be associated with various physiological and pathological changes in the thyroid gland, as hyperplasia, pure colloid goiter, adenomatous goiter, sarcomatous degeneration, or any combination of the aforementioned conditions[3].

There is still a disproportion today between the actual number of times the thyroid gland is involved in a tuberculous process and the number of times that thyroidectomy is done, to warrant calling the condition a clinical rarity. An incidence of 0.1 per cent is reported at the Mayo Clinic over a period of eleven years, in which 20,758 thyroid glands were removed surgically, and tuberculosis diagnosed 21 times[4].

Attempts to formulate a syndrome by which the disease can be recognized clinically have been rather fruitless, and as such the diagnosis is still a microscopic one.

(Continued on page 69)

The President's Page

THE Platform of the American Medical Association relative to a health program of National scope merits the support of each and every physician. It is printed in blackface in the editorial column of the Journal of the American Medical Association each week. Let us blackface the principles laid down in this platform by familiarizing ourselves fully with its precepts and calling them to the attention of our patients and friends in order that they may know just what organized medicine supports in the way of an expanded program of health.

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

Let us pull together as we never have before—for in union there is strength—and work diligently for the best interests of the public we serve through the principles as outlined in this platform by our parent body, The American Medical Association.

In all sincerity,

Chas. S. Smith M.D.

CHAS. S. SMITH, M. D., President.

Annual Meeting

OF

The Arizona State Medical Association

at TUCSON, ARIZONA

on APRIL 18, 19, 20, 1940

PIMA COUNTY MEDICAL SOCIETY—HOST

HEADQUARTERS—SANTA RITA HOTEL

Scientific Program

GUEST SPEAKERS:

1. EDWARD LEE DORSETT, M.D., Assistant Professor of Obstetrics and Gynecology, St. Louis University School of Medicine, St. Louis, Mo.
2. THOMAS J. HARRIS, M. D., American Board of Otolaryngology, New York City, New York.
3. JOHN SHELTON HORSLEY, M. D., Surgery, Richmond, Virginia.
4. S. D. INGHAM, M. D., Neurology and Psychiatry, Los Angeles, Calif.
5. HANS LISSER, M. D., Clinical Professor of Medicine, University of California, San Francisco, Calif.
6. CHAS. F. McKHANN, M. D., Assistant Professor of Pediatrics and Communicable Diseases Harvard Medical School, Boston, Mass.
7. WM. S. MIDDLETON, M. D., Dean and Professor of Medicine, University of Wisconsin Medical School, Madison, Wis.
8. Others to be announced later.

LOCAL SPEAKERS:

1. JOHN E. BACON, M. D., Miami, Arizona.
2. THOMAS H. BATE, M. D., Phoenix, Arizona.
3. E. PAYNE PALMER, M. D., Phoenix, Arizona.
4. H. G. WILLIAMS, M. D., Phoenix, Arizona.
5. To be announced later.

ROUND TABLE LUNCHEONS, BANQUET, PUBLIC MEETING, SECTIONS. AUXILIARY PROGRAM AND ENTERTAINMENT.. SEE MARCH ISSUE OF SOUTHWESTERN MEDICINE FOR PROGRAM IN FULL

Remember --- April 18-19-20 at Tucson

YOU ARE CORDIALLY INVITED TO ATTEND.

CASE REPORT

Present case of 44-year-old female (housewife) with chief complaints of (1) pain in the left ear, (2) noticeable enlargement of the neck, and (3) nervousness. Patient dates onset of present complaint to 2 months ago with noticeable neuralgic pain in the left lower cervical region. At that time she consulted her physician, who upon careful questioning was able to elicit complaints of recent weight loss of 7 lbs., nervousness, and loss of patience with her children, dyspnea, hot sensations and the requirement of a good deal of will power to perform the ordinary daily household tasks. In addition there was observed marked weakness in the knees, and intolerance to heat with a pronounced heart consciousness worse at night when lying on the left side. Appetite has remained good and not unduly ravenous. There has been no diarrhea or g. i. upset. Has observed scanty and irregular menses the past 4 months, which the patient thought was due to oncoming menarche.

Patient named had 2 children, both normal births. There was nothing noted in her past medical history other than occasional attacks of neuritis which have been relieved since tonsillectomy. There was a definite carcinoma history from the paternal side, but no history of goiter, nervous indigestion or famileal heredo-degenerative disease in the family.

Pertinent objective findings revealed a small, hyperkinetic female, about 40 years of age, very excitable with mildly protruding eyeballs with a moist skin, easily disturbed psyche and a diffusely moderately symmetrically enlarged thyroid gland that was definitely board-like and ligneous to the palpating hand. There was one small hard nodule the size of a hickory nut in the inferior portion of the left lobe. There were no enlarged lympth glands. The area of skin overlying the superficial left cervical plexus was definitely hyperesthetic. The chest presented no abnormalities. The cardiac impulse was diffuse, snappy, and very noticeable, the cardiac rate 110 rhythmic. There were no murmurs suggestive of relative insufficiency at any of the valves. The tendon reflexes were all hyperactive. Diagnosis of carcinoma of the thyroid was made with profound thyrotoxicosis.

Prior to hospitalization, patient had 3 weeks of bed rest, Lugols solution, and mild sedation with very little improvement in her clinical condition. The laboratory work revealed a negative urine and Kline tests. Blood serology was negative, r. b. c. 5,300,000, Hb. 16.3 gm., W. B. C. 8,050, neutrophiles 70%, small lymphocytes 30%. The sedimentation rate was 20 mm. in one hour, blood sugar 95.2 mg. per cent, blood cholesterol 220 mg. per cent, and the B. M. R. was 30%. The tuberculin test and x-ray of chest was negative for tuberculosis. After two days of preparation in the hospital with hypertonic glucose, mild sedation, and Lugol's solution, a total thyroidectomy was done, under ½ of 1% novocaine anesthesia. At the time of operation a very hard diffuse, slightly enlarged atrophic gland was found which on section cut with the typical cartilaginous grating sound of malignancy. There was no evidence of extra capsular extension of the pathology.

The immediate and subsequent post operative course of the patient was uneventful, presented no cardio-toxic, nervous or genito-intestinal upsets. The removed at operation presented a problem of differential diagnosis considering (1) malignancy (2) ligneous thyroiditis and (3) tuberculosis. Microscopic sections showed extensive chronic inflammatory changes. The glandular structure was atrophied, and in some areas completely obliterated due to marked inflammatory fibroplasia. There were granulomatous lesions, many of which with giant cells forming typical tubercles. A microscopic diagnosis of tuberculosis of thyroid was made.

Our follow-up records reveal that the patient has been well on one grain of thyroid extract daily which was administered to control the change in her metabolism to a myxedematous state. Basal metabolism rate was —28.

This case is reported because of its clinical rarity. While the literature is as yet not too voluminous on the subject, we must be constantly on the lookout for the more rare conditions of the thyroid gland.

BIBLIOGRAPHY

1. Coller and Ruggins. Annals of Surgery, Vol. 84 (1926), p. 804.
2. Mosiman. Surgery, Gynecology and Obstetrics, XXIV (1917), p. 840.
3. Mosiman. Tuberculosis of the Thyroid. Surg., Gyn. & Obs., XXIV (1917), p. 680.
4. Rankin, F. W., and Graham. A. S. Tuberculosis of the Thyroid Gland. Annals of Surgery, XCVI (1932), 625.

CASE REPORT

RETROGRADE INTUSSUSCEPTION OF JEJUNUM FOLLOWING GASTRO-ENTEROSTOMY

H. A. BARNES, M. D.
C. W. SECHRIST, M. D.
Flagstaff Hospital, Flagstaff, Arizona

This case illustrates how extraneous events can alter the course of a surgical convalescence. The patient had a no loop retro-colic posterior gastro-enterostomy performed. During the tenth week of his convalescence, and while on a diet quite satisfactory, the patient relates a history that is both unique and fascinating from the standpoint of differential diagnosis and the subsequent course followed on the basis of the suspected diagnosis. The events that occurred were both catastrophic in nature and alarming from the standpoint of the patient's safety, circumstances demanding immediate laparotomy at any cost and without great delay. The circumstances leading to the case are interesting. Knowing that the patient had a gastro-jejunostomy, the local physician deduced the diagnosis of perforated ulcer on the basis of old diagnosis of ulcer, recent gastro-enterostomy, severe

agonizing upper abdominal pain, and shock of extreme grade.

Recapitulation of history reveals that patient came home at 10 p. m. driving his own automobile, and when entering his garage he made a sudden stop, jamming his right foot on the brake when he saw an object in the direct line of vision of his car. Upon further investigation, the patient found that in his attempt to stop his car slightly too late that the rope from an overhead suspended swing used by his children earlier in the day had become entangled in the front running gear of his car. Slightly piqued at the incident he started to pull at the rope to disentangle it from the gear.

He states at the time he felt no pain, retired as usual about 10:30 p. m., telling his wife that this was the best day he had had to date. At 2 a. m. he was suddenly awakened by excruciating upper abdominal pain. A local physician was summoned and a tentative diagnosis of perforated duodenal ulcer was made. Upon careful questioning of the patient, he stated that he was suddenly seized with severe agonizing pain in the epigastrium followed with nausea and vomiting of clear liquid at first. The pain was knife-like in character and occupied the greater part of the abdomen. Vomiting persisted enroute to the hospital, a distance of 35 miles, and definitely changed in character from a watery to a bloody type, increasing the severe shock that had already supervened. Examination prior to laparotomy which was done under local anesthesia revealed a soft pulse, 96, rhythmic, a soft slightly distended abdomen, very tender to palpation in all quadrants. The recti were not rigid, and no tumor masses were palpable.

At laparotomy the stomach appeared normal, the duodenum presented no abnormalities, or sign of perforation. A moderate amount of pale sanguinous fluid was found in the peritoneal cavity. Approximately 2.5 feet of proximal jejunum were dilated, all coats suffused with blood, sausage-like, and very dusky including the entire vascular mesenteric pedicle. Beginning with small collapsed bowel an obstruction was searched for at the site of the previously made gastro-jejunostomy opening. With very slight tension on the anastomosed jejunal loop apparently all obstruction was relieved, the jejunum assuming its normal position in the abdomen after being freed from its position of aspiration through the mesocolon. Because of the precarious condition of the patient a jejunostomy was done. Hot saline packs to the bowel were sufficiently encouraging in their effects to warrant closure of the abdomen. Siphon drainage was applied via the duodenal tube and intermittent decompression to the jejunostomy for 24 hours.

The patient made a rather stormy recovery after the surgical emergency was taken care of; however, the biochemical aspects of fistula, upper intestinal obstruction, and mineral balance presented a complex biochemical problem including accurate observance of water intake and water output, the accurate measurement of the loss of small intestine secretion and an observance of certain factors in wound healing where fistula is present. Never have I seen recovery with such extensive ileus of the small bowel and its associated vascular distortion of the mesentery.

According to Bailey, in the majority of cases intussusception occurs long after gastro-jejunostomy has been performed. If the condition is borne in mind, it is by no means impossible to make a correct preoperative diagnosis. Symptoms as a rule occur suddenly. The pain is griping, epigastric, and colicky. Vomitting soon occurs, and is frequently repeated—the vomitus is first of all food, then bile and then blood. Rigidity and tenderness are characteristically absent ,and perforated gastro-jejunal ulcer can then be ruled out.

COMMUNICATIONS

Sir:

We would appreciate it if you would announce the time and place of the next annual meeting of the American Association for the Study of Goiter. This meeting will be held at Rochester, Minn., April 15, 16 and 17, 1940. The program for the three-day meeting will consist of papers dealing with goiter and other diseases of the thyroid gland, dry clinics conducted by guests of the association, and operative clinics conducted by the staff of the Mayo Clinic.

The association is offering the Van Meter prize award for the best essay presented in competition. We would, of course, appreciate any publicity that you may feel disposed to grant us in your journal concerning this award.

Very truly yours,
W. BLAIR MOSSER, M. D.,
Corresponding Secretary.

Sir:

The New Mexico Medical Society will hold its annual meeting in Albuquerque, May 27, 28 and 29, 1940.

Please publish these dates in SOUTHWESTERN MEDICINE.

Fraternally yours,
NEW MEXICO MEDICAL SOCIETY,
L. B. Cohenour, M. D., Secretary-Treasurer.

Sir:

In addition to the articles enumerated in our letter of December 6, the following have been accepted:

Abbott Laboratories—Sterile solution thiamin chloride-Abbott, 250 mg., 5-cc. bottle; sterile isotonic solution thiamin chloride-Abbott, 100 mg., 10-cc. bottle; tablets thiamin chloride-Abbott, 6 mg.

Cutter Laboratories — Sobisminol mass-Cutter

capsules; sobisminol solution-Cutter, ampoules 1 cc.; sobisminol solution-Cutter, ampoules 2 cc.

Eli Lilly and Company — Combined diphtheria toxoid-tetanus toxoid, alum precipitated, two 1-cc. vials package; combined diphtheria toxoid-tetanus toxoid, alum precipitated, one 10-cc. vial package; pulvules sobisminol mass-Lilly; sobisminol solution-Lilly, ampoules 1 cc.; sobisminol solution-Lilly, ampoules 2 cc.; sobisminol solution-Lilly, ampoules 50 cc.

E. R. Squibb & Sons—Sobisminol mass-Squibb capsules; sobisminol solution-Squibb, ampuls 1 cc.; sobisminol solution-Squibb, ampuls 2 cc.; sobisminol solution-Squibb 50 cc.; epinephrine in oil-Squibb.

Yours sincerely,

COUNCIL ON PHARMACY AND CHEMISTRY,
Paul Nicholas Leech, Secretary.

NEWS

General

The American Association for the Study of Goiter again offers the Van Meter prize award of three hundred dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association, which will be held at Rochester, Minn., on April 15, 16 and 17, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigation, should not exceed 3,000 words in length, must be presented in English, and a typewritten, double-spaced copy sent to the corresponding secretary, Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., not later than March 15.

A place will be reserved on the program of the annual meeting for presentation of the prize award essay by the author if it is possible for him to attend. The essay will be published in the annual proceedings of the association. This will not prevent its further publication, however, in any journal selected by the author.

El Paso

A regular meeting of the El Paso County Medical Society was held January 22, 1940, at 8:00 p. m. in the tea room of the Hotel Cortez. The program presented was as follows: "Psychologic Aspects of Pediatrics," Dr. I. M. Epstein; "Bacteriophage Therapy," Dr. L. O. Dutton; "Pituitary Tumor," Dr. A. P. Black.

The regular dinner and staff meeting of the Southwestern General Hospital was held Thursday, January 25, 1940, at 6:30 p. m. in the hospital auditorium. The program was as follows: "Typhoid Fever," Dr. J. E. Morrison; discussion, Dr. C. D. Awe; "Spontaneous Rupture of the Tendon of Achilles," Dr. F. C. Goodwin.

A regular meeting of the Tumor Clinic was held Tuesday, January 9, 1940, at 1 p. m. at City-County Hospital. The program was a follow-up of old cases.

A regular meeting of the staff of Hotel Dieu Sisters' Hospital was held Tuesday, January 9, 1940, at 12:15 p. m. in the auditorium of the nurses' home. Luncheon was served. The program was as follows: "A Case of Coronary Thrombosis," Dr. Stevens; discussion, Dr. Werley, Dr. Waite and O. J. Shaffer, D. D. S.; "A Case of Ruptured Duodenal Ulcer," Dr. Green; discussion, Dr. Gallagher and Dr. Gorman.

The El Paso County Medical Society met at Hotel Cortez Monday, January 8, 1940, at 8:00 p.m. The program consisted of the following case reports: "Pituitary Tumor," A. P. Black, M. D.; "Pneumolysis" (2 cases), Paul Gallagher, M. D.; "Carcinoma of Sigmoid" (3 cases), J. L. Murphy, M. D.

AUXILIARY NEWS

El Paso

The regular meeting of the Woman's Auxiliary to the El Paso County Medical Association was held Monday, January 8, 1940, at 12:30 p. m. at the Hilton Hotel.

During luncheon the musical part of the program was given. Mrs. Harold Gates gave a flute solo and Mrs. Oscar Allen, Jr., sang two numbers. After luncheon, Mr. R. E. Sherman addressed the auxiliary, his subject being "Housing and Slum Clearance." Also guests were Mayor J. E. Anderson and Mr. Frank Fletcher, who is chairman of the Housing and Slum Clearance Project in El Paso. After the program, the business meeting was held, with Mrs. Branch Craige, president, presiding.

The chairman for the luncheon was Mrs. Louis W. Breck, assisted by Mesdames Raymond P. Hughes and Leslie Smith.—*Malvina Spearman.*

CORRECTION

(Continued from page 65)

1. On page 22 the birth date of Dr. Leslie M. Smith was stated to be August 8, 1885. The date should be August 8, 1895. Dr. Smith is neither chronologically, mentally or physically as old as was alleged.

2. On page 31 a gentleman was called Murray Heal. The name is Neal. In no way does Murray deserve the inadvertant sobriquet.

And now the editorial staff will all go soak our heads.

MISCELLANY

ASCHOFF BODIES

These structures were first described by Ludwig Aschoff, then professor of pathology at Freiburg, in an article entitled "Zur Myocarditisfrage (The Problem of Myocarditis)" which may be found in the *Verhandlungen der deutschen pathologischen Gesellschaft* (8:46-53, 1904). A section is translated as follows:

We succeeded in finding peculiar nodules which seemed to be specific for rheumatic myocarditis. These nodules were clearly marked, it is true, in only two cases of recurrent endocarditis, but corresponded in their location exactly to the cellular proliferation found in other cases. They usually lay in the neighborhood of small or medium-sized blood vessels and often showed the most intimate relation to the adventitia of these vessels, or there was found simultaneous involvement of all layers of the blood vessels, such as has been described in arteritis nodosa. The nodules are extremely small, at most submiliary in size, and arise through the collection of notably larger elements with one or more abnormally large, slightly notched or polymorphic nuclei. The aggregation of cells often occurs in the form of a fan or rosette. The periphery is formed by the large nuclei; the center by the confluent protoplasm of the cells which often seems to stain weakly or otherwise appears to be a necrotic mass. The fan-shaped foci recall, when superficially observed, the tiny necrotic areas of gout with the peripheral cell mantle as they are frequently found in gouty kidneys.—*N. E. J. of Med.*

ORAL BISMUTH THERAPY IN SYPHILIS

Now, for the first time, appears a metallic preparation which seems to be useful when administered orally for the treatment of syphilis. This form of therapy is certainly not advisable except for intelligent, co-operative patients. It is essential that the patient take the medication regularly, as directed by the physician, or that the physician insist on the intramuscular route for therapy for uncooperative patients. There are, of course, certain instances in which the oral route of medication would be a valuable adjunct in syphilis therapy. It can be used with caution for those individuals whose business or profession necessitates occasional absences from the physician's supervision. It should prove useful for those rare persons who have unusual difficulty in taking intramuscular injections because of resultant pain and induration of the muscles. It is also possible that in selected cases of congenital syphilis and in some cases of cardiovascular and latent syphilis the oral route of medication would be distinctly useful. In the course of experiments on the utilization of sodium bismuthate in antisyphilitic ther-

FACTORS IN THE PATHOGENESIS OF EDEMA — LANDIS

FACTORS FAVORING EDEMA FORMATION	CLINICAL EXAMPLES
A. Primary	
1. Elevated capillary pressure	1. (a) Varicose veins, external pressure on veins (b) Thrombophlebitis, superficial (c) Thrombophlebitis, deep (Phlegmasia Alba Dolens) (d) Cardiac edema with venous congestion
2. Lowered colloid osmotic pressure	2. (a) Nutritional (hypoprotein) edema (b) Nephritic edema (c) Cardiac edema, late stages with malnutrition
3. Damage to capillary wall	3. (a) Inflammatory edema (b) Nephritic edema (c) Cardiac edema (chronic anoxemia) (d) Peripheral arteriosclerosis or occlusion (anoxemia)
4. Lymphatic obstruction	4. (a) Lymphedema due to malignant occlusion, surgical removal of lymph nodes, lymphangitis with lymphatic thrombosis, etc. (b) Lymphedema of Phlegmasia Alba Dolens
5. Lymphangiectasis	5. (a) Congenita lymphedema (b) Valvular incompetence following lymphangitis (c) Heat of tropics
B. Contributory	
6. Low tissue pressure	6. (a) Edema of periorbital tissues and genitalia
7. High tissue fluid colloid pressure	7. (a) Elephantiasis nostros
8. High salt intake	8. (a) Increases edema if water is available
9. High fluid intake	9. (a) Increases edema if salt is available
10. Warm environment	10. (a) Heat edema (b) Increases all types of edema
11. Disturbed innervation	11. (a) Tropho-edema as after subarachnoid alcohol block (b) Unilateral edema in hemiplegia (c) Angioneurotic edema
12. Endocrine inbalance	12. (a) Myxedema (b) Menstrual edema

—*Va. Med. Mo.*

apy, Hanzlik, at Stanford University, evolved preparations resulting from the interaction of sodium bismuthate, tri-isopropanolamine and propylene glycol, known as sobisminol mass and sobisminol solution. These products have been before the Council on Pharmacy and Chemistry for approximately 3 years, a period which was necessary for the accumulation and proper evaluation of evidence for the efficacy of the orally administered product. These products, as well as various marketed brands, have now been accepted by the council. According to agreements between the board of trustees of Stanford University and each of the three firms already licensed to manufacture the product, every legal effort is beng made to prevent the sale of capsules of sobisminol mass to the public other than on or by the prescription of the physician. Distribution of such a product to the public would obviously result in inadequate treatment of unrecorded and uncontrolled bases, and thus would become a serious menace to the individual and to the public health. Lastly, it is pointed out that oral administration of bismuth compounds is not intended to replace the generally accepted use of bismuth preparatons intramuscularly, except where special conditions prevail.—*J. A. M. A.*

ADAMS-STOKES DISEASE

Robert Adams (1791-1875), one of the surgeons to Jervis Street Infirmary, Dublin, describes "Cases of Diseases of the Heart, Accompanied with Pathological Observations" in the *Dublin Hospital Reports* (4:353-453, 1827). On page 391 appears the following:

February 20, 1822, I was called to visit a gentleman in my neighborhood, aged 50 years, who had suddenly fallen down, as reported to me, in an apoplectic fit. I found him in a state of complete insensibility; his face(naturally pale and sickly) was now red and bloated; his breathing stertorous, with a slow pulse. . . . In the last year he had two apoplectic attacks, exactly resembling that which I had just witnessed; from these he recovered without any paralysis of the muscles. . . .

An officer in the revenue, aged 68 years, of a full habit of body, had for a long time been incapable of any exertion, as he was subject to oppression of his breathing and continued cough. In May, 1819, . . . I saw this gentleman; he was just then recovering from the effects of an apoplectic attack, which had suddenly seized him 3 days before. . . . . What most attracted my attention was the irregularity of his breathing, and remarkable slowness of the pulse, which generally ranged at the rate of 30 in a minute. . . . (During 7 years he had been seen) in not less than 20 apoplectic attacks. . . . He would then fall down in a state of complete insensibility. . . . His pulse would become even slower than usual. . . . He recovered from these attacks without any paralysis. . . . In both these cases . . . apoplexy must be considered less a disease in itself than symptomatic of one, the organic seat of which was in the heart.

William Stokes (1804-1878) in his article, "Observations on Some Cases of Permanently Slow Pulse," which appeared in the *Dublin Quarterly Journal of Medical Science* (2:73-85, 1846), refers to these case histories as follows:

In the fourth volume of the *Dublin Hospital Reports*, Mr. Adams has recorded a case of permanently slow pulse, in which the patient suffered from repeated cerebral attacks of an apoplectic nature, though not followed by paralysis. The attention of subsequent writers on diseases of the heart has not been sufficiently directed to this case, which is an example of a very curious, and, there is reason to believe, special combination of symptoms.—*N. E. J. of Med.*

PREVENTION OF SILICOSIS

The interest of industrial hygienists has recently been aroused by the report of Denny, *et al.*, that the inhalation of powdered metallic aluminum prevents silicosis. From experimental evidence, it appears that the toxicity of silica comes from that portion which is in the dispersed collodial form and this can be inactivated by aluminum when the latter is in close association with quartz in the body cells.

Rabbits which were exposed to quartz dust alone all developed silicosis within a period of 7 months. On the other hand, where the quartz dust was mixed with metallic aluminum powder in a concentration of 1%, no animals showed any evidence of silicosis up to periods of 17½ months. For the prevention of the disease, Denny and his co-workers suggest that the aluminum dust should be below 5 microns in particle size and be free from grease. The dust should preferably be uniformly mixed with silica dust, but will also be effective if inhaled each day independently. In itself, aluminum dust showed no effect on the health of the animals, and no toxicity or tissue damage.

Metallic aluminum in the tissues is converted into hydrated alumina, which, by flocculation, by the adsorption of silica from solution, and by covering the quartz particle with an insoluble and impermeable coating, is able to reduce the toxicity of quartz in the tissues.—*N. Y. St. J. Med.*

A PROFESSION OR A TRADE?

The United States owes an incalculable debt to the American Medical Association. Whatever criticisms may now be aimed at it by the idealistically-minded who are shocked at obvious imperfections in the medical services available to the people as a whole, the fact remains that the organized profession itself, voluntarily and from a sense of duty, is responsible for about everything "social" in the practice of the healing arts today. It found American medicine in a chaotic condition. There were essentially no minimum standards of education or of competence. In most states a few years as helper in a doctor's office or around a hospital and the passing of a written examination were sufficient to launch a man on the practice of medicine. The American Medical Association has

worked ceaselessly for higher and higher minimum requirements. It has practically eliminated low-grade medical schools. It has made the acquiring of a doctor of medicine degree and a state license to practice a major struggle for any man and a hopeless struggle for an individual of mediocre intelligence. The public now is absolutely assured that any man who has been graduated from an American medical college and passed a state board examination is highly competent. It is reasonably assured that he is not lazy or careless, unless his personality undergoes a remarkable change after he leaves college; and it is reasonably assured that he is not scoundrel, for dishonesty could hardly get through the filter of present-day medical education, for which the American Medical Associaton is responsible.

— *Jo. Iowa St. Med. Soc.*

MEDICINE—AND MORE

I know of no calling which offers such a wide diversity of intellectual pleasure as that of medicine, not alone in its art and science, with an ever increasing range of new developments, but in human behavior, psychology, sociology, economics, and related activities; we follow a most useful calling, an interesting occupation filled with new and striking problems and one of the best because its only aim is the benefit of man.

Medicine is the most ancient of professions, being older than Christianity and antedating the inception of civil law. It has its own system of rewards and punishments, its own disappointments and its own glories. It is a profession that has a broadening influence on the human mind and is characterized by a most splendid charity. It is an acquisition in the best tendencies and a protection against the worst tendencies.

It constructs no trusts; it founds no monopolies; it excludes no qualified pratctitioner; it retains for its profit no valuable discovery and it has no standing room for the quack, the scoundrel and the charlatan.

Its best work is done in the light which beats upon its throne, not in the arena of politics encouraged by the cheers of thousands, not in the seclusion of the cloister sustained by the hope of eternal joy, but in the storm- and wind-swept country, in the streets of the village, in the boulevards of the city, on the desolate field of battle where pain and pestilence, illness and misery are combated often with none but God to see it. It furnishes a curiously checkered life, a life in which storm clouds alternate with sunbeams. With the exception of the ministry it stands closer than any other calling to the secret of eternity and watches death ever busy with her shuttle as she weaves her somber threads into the woof and warp of the affairs of men.

It seeks to mitigate human suffering, to prolong human life. These have ever been its watchwords, are still and always will be, constituting its cloud of smoke by day and its pillar of fire by night. One should enter such a profession with properly exalted ideals: with a belief in its greatness, its dig-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

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nity, its stability, its real importance, its essential strength. One should resolve to learn to observe, to compare, to analyze, to study, to think, to avoid formulas, to cast out sordid thoughts, to repudiate shallowness, advertising, and vain pretensions.

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BOOK NOTES

AN INTRODUCTION TO GASTRO-ENTEROLOGY, by Walter C. Alvarez, M. D., Professor of Medicine, University of Minnesota, the Mayo Foundation, and a Senior Consultant in the Division of Medicine, the Mayo Clinic. 3rd edition of The Mechanics of the Digestive Tract. Pp. 778, including index. Illustrations 186. Cloth. $10.00. New York, Paul B. Hoeber, Inc. Medical Book Department of Harper & Bros. 1939.

Any one who has read previous publications of the author—and we all have; any one who is interested in the digestive tract—and we all are—will find several hours of valuable and pleasurable problems simplified by adding this superior and exceptional volume to his library.

Written in the usual pleasing style of the author the subject matter immediately and continuously holds the interest of the reader. Aside from the expression of his own personal views, based on years of clinical experience and scientific research, the author presents the experimental and clinical studies and conclusions of several hundred clinicians and scientists as acknowledged in a bibliography including over two thousand references.

This volume, indispensable to the gastroenterologist and to the research student, should be of inestimable value to the surgeon, and every physician, regardless of his specialty, could improve his clinical acumen by a careful review of the short summary appearing at the conclusion of each chapter referring to the text for a more detailed study as a single point attracts his special attention.

The author elaborates his previous conception of polarization of the bowel and discusses the probable relationship of the gradients to polarization.

The application of the principles of physiology to every day symptoms is stressed and further elucidated by the inclusion of case histories pertinent to the point under discussion. Suggestions regarding treatment in the light of physiologic concepts are included. The problems yet to be solved are clearly stated.

The final chapter is devoted to a review of books and journals best adapted to the student who desires to increase his fund of knowledge in gastroenterology and associated fields.

Too quickly, we come to the end of a monumental volume to be placed on the shelf but not for long, for as a ready reference it should answer many of our future problems.—J. J. G.

CITRUS FRUITS AND HEALTH, Clinical and Scientific Data from the Literature of Nutrition as related to Citrus Fruits. Pp. 73 including Bibliography. Paper. Lakeland, Florida, Florida Citrus Commission. 1940.

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"Citrus Fruits and Health," just issued under the seal of the State of Florida.

The book is one phase of a research program which has been carried on for the last 3 years by the Florida Citrus Commission, with grants to outstanding scientific institutions for new studies on the health values of oranges, grapefruit and tangerines.

The book is a concise but comprehensive treatment of "the physiology, pathology and therapeutics of the accessory substances as related to the citrus fruits," along with examples, figures and opinions from clinical and scientific sources.

Written especially for the medical and dental professions, the book was prepared with the counsel and co-operation of an advisory board which included internationally recognized authorities in medical and dental research, nutrition and biochemistry.

Although much has been written in the past on the health attributes of citrus fruits, this work is the first to bring into a single volume the various known aspects of the fruits in their relation to health and disease.

"Citrus Fruits and Health" discusses the fruits in their relation to public health, special diets, infancy and growth, calcium assimilation, pregnancy and lactation, the teeth, disease, increased metabolic states, toxemias, surgical diseases, the infections, resistance to infection, and contains suggested dietary uses of oranges, grapefruit and tangerines.

JEWISH CONTRIBUTIONS TO MEDICINE IN AMERICA from Colonial Times to the Present; by Solomon R. Kagan, M. D.; Foreword by Prof. James J. Walsh; second edition revised and enlarged; published by the Boston Medical Publishing Company; Boston, Massachusetts; 1939.

As this is the second edition of this book I suppose the "labor of love" of writing it has been rewarded by a slight financial return to the author. Collecting the biographies, even though many of them are autobiographies, of around 900 to 1,000 physicians is no small task. The very stimulus which was active in causing the author to write the book is undoubtedly the same as has caused its going through a second edition, namely, the desire of the Jew to know what his race or people has contributed to medical advancement of America. One wonders if the Jewish people are not sufficiently integrated without a recitation of the splendid achievements of their men of the medical profession. Such a proposition may not be for the best interests of either the American Jews or the American people as a whole. Suppose those of the Catholic faith were to compile the accomplishments of their men of medicine, and then the Methodists, Baptists, Presbyterians, Episcopalians, etc., might feel called upon to do the same for those of their faiths. What would be the end results?

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ability and propriety of such a volume the fact remains that one may find in it the facts about the lives and accomplishments of many of the great American physicians. It is a book of nearly 800 pages. There are many facts in it besides those specifically about physicians. The two chapters I would mention are those entitled "Jewish Medical Institutions" and "Jewish Medical Philanthropy."

The book is a valuable contribution to the medical history of America and will be so recognized by all students of the subject.—*O. H. B.*

MEDICAL CARE (A Symposium). Law and Contemporary Problems (Duke University Law School, Durham, N. C.), Autumn, 1939, Vol. VI, No. 4, 186 pages. 75 cents, postpaid.

Private and governmental plans to remove economic barriers to the availability of medical care are studied in a symposium on "Medical Care." published as the autumn, 1939, issue of Law and Contemporary Problems, the Duke University Law School quarterly. The rapid spread of medical and hospital care corporations furnishing service on the prepayment plan and the pendency of the Wagner National Health Bill in Congress together provide the occasion for the publication of the 14 articles comprising this symposium.

After an introductory article analyzing the salient questions presented by the national health problem comes a group of articles directed to experimentation with plans under private auspices. Representative plans are depicted, and the ethical and legal bases of opposition to them are examined. Enabling legislation, already enacted for hospital care plans in 24 states and for medical care plans in 4, is analyzed, together with problems in the administration of the plans which already have been established.

Special attention is devoted to the recently organized California Physicians' Service in which 5,000 of California's 7,000 physicians have thus far enrolled. An article is also devoted to the medical care program developed for over 100,000 Farm Security Administration borrowers by the FSA and county medical societies in 22 states.

Among the contributors to this section of the symposium are M. W. Brown, general secretary of the Bureau of Co-operative Medicine; Dr. C. R. Rorem, director of the American Hospital Association's Commission on Hospital Service, and Dr. R. C. Williams, chief medical officer of the Farm Security Administration.

Five articles in the symposium discuss problems presented by the National Health Bill, introduced by Senator Robert F. Wagner of New York, which would amend the Social Security Act by authorizing federal grants in aid of state public health programs and systems of health and disability insurance. Included among these articles is an analysis of the various bills introduced in state legislatures last winter looking to the establishment of compulsory health insurance systems. A detailed study is also presented of the problems of need, administration and cost to be considered in formulating state or federal disability insurance systems.

Among contributors to this group of articles are Dr. I. S. Falk, author of "Security Against Sickness" and assistant director of the Social Security Board's Bureau of Research and Statistics; Dr. L. S. Reed, author of "Health Insurance," and Prof. Clarence Heer, University of Carolina economist, recently appointed by Administrator Paul McNutt to the Federal Security Agency's "brain trust."

THE PSYCHOLOGICAL ASPECTS OF COD LIVER OIL ADMINISTRATION

Some authorities recommend that cod liver oil be given in the morning and at bedtime when the stomach is empty, while others prefer to give it after meals in order not to retard gastric secretion. If the mother will place the very young baby on her lap and hold the child's mouth open by gently pressing the cheeks together between her thumb and fingers while she administers the oil, all of it will be taken. The infant soon becomes accustomed to taking the oil without having its mouth held open. It is most important that the mother administer the oil in a matter-of-fact manner, without apology or expression of sympathy.

If given cold, cod liver oil has little taste, for the cold tends to paralyze momentarily the gustatory nerves. As any "taste" is largely a metallic one from the silver or silverplated spoon (particularly

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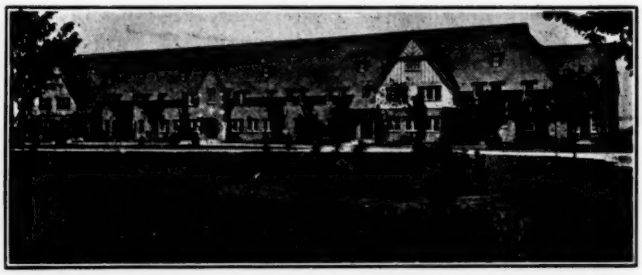

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Index To Advertisers

Bank, Joseph II
Bilhuber-Knoll IV
Borah, Chas. E. II

Clohessy, T. T. II
Cutter Laboratories ..... Cover 4

Dorsey-Burke Drug Store IV

Gatterdam, E. A. II
Giere, C. Norman III

Holmes, Fred G., Randolph, Victor, and Randolph, Howell II
Homan, Ralph H. III

Jordan, Gerald H. III

Las Encinas Sanatarium V
Lilly & Company, Eli X
Los Angeles Tumor Institute I
Lovelace Clinic II
Lynch, K. D. III

Mason-Miller Drug Co. IV
Mead Johnson Company IX
Medigovich, D. V. II
Merck & Co., Inc. 77
Philip Morris & Co. Ltd., Inc. VII
Multhauf, A. William III
Myers, John W. II

Natl. Asn. of Chewing Gum Mfgrs. I

Owens, Hala, Sanitarium II

Pathological Laboratory ..... Cover 1
Pathological Laboratory II
Parke, Davis & Company VIII
Petrolagar ..... Cover 2
Physicians' Casualty Asociation 79
Purcell, H. M. II

Rosenbaum, M. G. II

Safford, Henry T. III
S. M. A. Corp. ..... Cover 3
Smith, Leslie M., Hughes, Raymond P. III
Snidow, Francis A. III
Southwestern Surgical Supply Co. 76
Specialists in the Southwest ..... II, III

Turner's Clinical & X-ray Laboratories 75
Taylor Printing Co. 79

Upjohn Co., The VI

Vance, James III
Vandevere, W. E., Spearman, M. P. III

Wayland Prescription Pharmacy IV
Werley, G. III
Womack Clinic III
Woodcroft Hospital 78
Wyeth & Bro., John 74